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AMERICAN JOURNAL OF OPHTHALMOLOGY

Volume 13 April, 1930 Number 4

THE WILLS HOSPITAL CLINIC FOR THE TREATMENT OF OCULAR SYPHILIS

JOSEPH V. KLAUDER, M.D.,* AND HAROLD F. ROBERTSON, M.D.†

PHILADELPHIA

At Wills Hospital, Philadelphia, devoted exclusively to the care of ocular disorders, it has been found desirable to centralize the treatment of syphilis in a special department. This department is under the care of syphilologists who act in cooperation with the visiting and resident ophthalmologists of the hospital. Illustrative cases are described, and examples are given of the records made for this type of case under the respective classifications of congenital syphilis, neurosyphilis, and general syphilis. Emphasis is laid upon the necessity for individualization of treatment for each case, rather than the routine application of antisyphilitic therapy regardless of the ocular condition, of the age of the patient, of the stage of the disease, and of other considerations. All the accepted methods of treatment are employed, but the administration of bismuth has been found advantageous, especially in cases of interstitial keratitis. Read before the section on ophthalmology of the College of Physicians of Philadelphia, October, 1929.

Our knowledge of syphilis in its clinical, pathologic, laboratory, and therapeutic aspects has greatly increased within recent years. The literature of the disease has become voluminous. The number of new therapeutic agents is increasing. Treatment is becoming more complex, so that the therapeutic management of syphilis has in a large measure become the work of the specialist. The administration of so-called mixed treatment or mercury rubs no longer constitutes, as it did years ago, the limit of therapeusis.

A physician undertaking the management of modern therapy of syphilis should be familiar with the following considerations: (1) The numerous preparations of arsenic, mercury, bismuth, and other spirocheticidal drugs, also other therapeutic agents; their clinical status; their therapeutic index (ratio of therapeutic dose to lethal dose in experimental rabbit syphilis); their mode of administration; their toxicologic reactions and the contraindications to their employment. (2) What constitutes intensive treatment, its hazards, when to employ it, and when it is contraindicated. (3) Weighing the hazard of treatment against the hazard of the disease. (4) When to carry out a formula of treatment; when to individualize and fit the treatment to the patient. (5) The dosage to employ, the interval between administration and how long to treat. (6) The indications for a spinal fluid examination. (7) When a patient is a proper candidate for marriage. (8) A realization that a positive Wassermann reaction is not being treated, but rather a patient with a systemic infection whose status is determined by clinical and laboratory examination. (9) A comprehensive knowledge of the methods of laboratory and serologic diagnosis and the interpretation of positive and negative results.

The physician handling such cases should be able to visualize syphilis as an infection from a pathological and clinical viewpoint, and should be familiar with the subjective and objective

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symptoms of syphilis of the different organs.

The purpose of the clinic

In view of the complexity of modern therapy, and bearing in mind the importance of "follow-up" system in proper treatment, of familial studies in patients with congenital syphilis, and the many ramifications of syphilis in clinical medicine, it was deemed desirable to centralize the treatment of syphilis at Wills Hospital in one department. All patients with eye diseases of syphilitic origin, patients with positive Wassermann reactions in whom the relation of syphilis to the eye condition is doubtful, and patients in whom a routine preoperative Wassermann reaction is positive are referred to a central clinic for antisyphilitic treatment. The patient is referred with a report of the Wassermann reaction, a description and a diagnosis of the ocular lesion. Such patients continue to attend the eye clinic for local treatment of the ocular lesion. This central clinic* is called the treatment clinic in order to camouflage the word "syphilis".

The primary motive in the treatment of patients with syphilitic lesions of the eye should not only be the healing of the eye lesion but the cure or arrest of their general syphilitic infection.

The attitude of the therapeutist should not be directed at an inflamed cornea or uveal tract but rather at the patient with a systemic infection having an ocular manifestation. Accordingly, the treatment of eye lesions due to syphilis should not consist simply of routinely administering antisyphilitic drugs. It becomes necessary through a complete examination of the patient to determine the status of the syphilitic infection and to adapt the treatment to the patient rather than carry out a routine or formulated plan of treatment.

The personnel of the clinic

The personnel consists of two visiting physicians who take the histories of the patients with reference to their syphilitic infection, conduct a general physical examination, determine the status of the infection, and formulate a plan of treatment. A resident physician, completing a graduate course in ophthalmology, acts as the ophthalmologist in the clinic and as a liaison officer for the eye clinics and the syphilitic clinic. He especially conducts all ophthalmologic examinations (in addition to or supplementing such examinations in the eye clinic).

A clerk assists in history taking, typewrites histories and progress notes, maintains a file and a cross index of diagnosis, and acts as a social service worker. Two graduate nurses and a student nurse, in addition to the usual work of a clinic nurse, are trained to perform venipuncture for the Wassermann test and for intravenous injections, and to administer intramuscular injections. The work of the nurses in giving injections is done only in the presence of a physician.

Case records

From the viewpoint of history-taking, physical examination, and therapy, patients with syphilitic lesions of the eye are classified in reference to the status of their systemic infection, in the following groups:

Congenital syphilis: This group embraces notably patients with interstitial keratitis.

Secondary and late secondary syphilis: This group embraces patients with uveitis and chorioretinitis.

Tertiary syphilis: This group embraces mostly patients who present pathologic changes in the fundi, also many patients with doubtfully non-syphilitic eye lesions but with positive Wassermann reactions, and those patients with preoperative positive Wasserman reactions.

Neurosyphilis: This group notably embraces patients with optic atrophy and with ocular muscle paralysis.

Since the history and physical examination vary somewhat with patients in these groups, three separate case-

* The clinic also functions as a skin clinic. The treatment of skin diseases, however, is a minor part of its work.

record sheets are employed, having different colors. The "white" form is used for congenital syphilis, the "pale blue" for neurosyphilis, and the "pale yellow" for general syphilis. The last mentioned record sheet is used for all patients other than those with congenital or nerve syphilis.

These separate forms, filled in with the history, the physical examination, laboratory tests, and treatment of three different patients attending the clinic are shown in appendixes 1, 2 and 3.

The chain of circumstances in the history and physical examination of patients presenting variable ocular lesions of syphilis is thus shown and needs no further comment.

The work of the clinic

A plan of the work of the clinic is shown as figure 1. Each phase of this plan concerns the aforementioned clinical grouping of patients, the examination, and the treatment. Each phase will be discussed separately.

Congenital syphilis

Congenital syphilis is notably represented by patients with interstitial keratitis. The history taking and examination of these patients are shown as in the case record given as appendix 1. In addition to a general study of interstitial keratitis and its therapy with reference to the prevention of involvement of the other eye, there are phases that merit particular attention. For example, the intimate relation existing between a nonpainful hydroarthrosis (Clutton's joints) and interstitial keratitis; the rôle of trauma* in precipitating interstitial keratitis; the incidence of ocular syphilis in the parents and brothers and sisters of patients with interstitial keratitis, from the viewpoint of infection with a strain of spirocheta pallida having a selective action for ocular involvement.

Since interstitial keratitis is a phase of congenital syphilis, its proper study

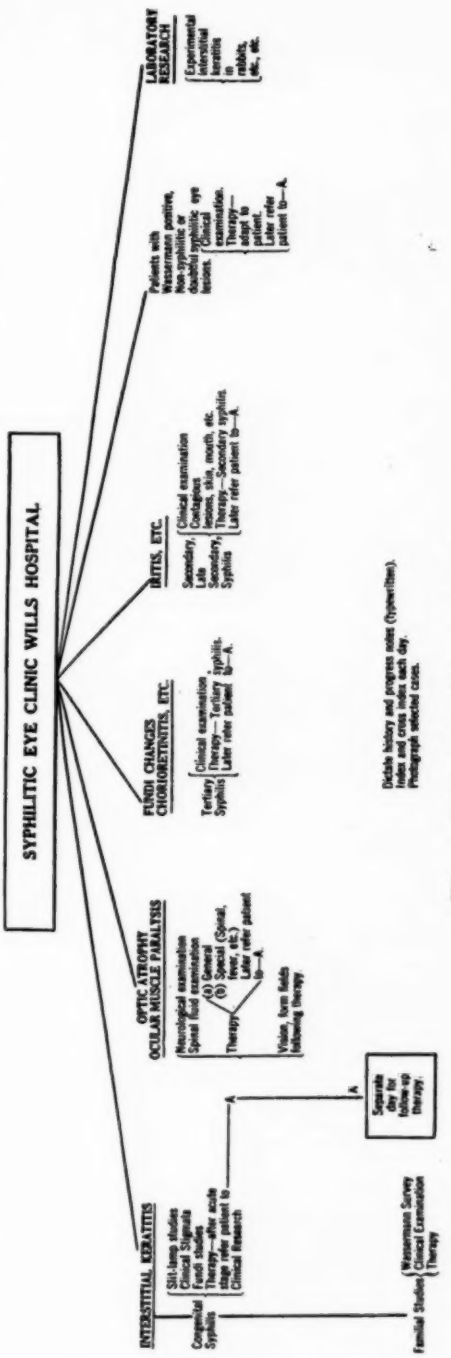
SYPHILITIC EYE CLINIC WILLS HOSPITAL
LABORATORY RESEARCH
Experimental interstitial keratitis in rabbits, etc., etc.
Patients with Wassermann positive, non-syphilitic or doubtful systemic eye lesions.
Clinical examination. Therapy—adapt to patient. Later refer patient to—A.
WILLS, ETC.
Secondary, Late Secondary, Syphilis
Clinical examination Contagious lesions, skin, mouth, etc. Therapy—Secondary syphilis Later refer patient to—A.
FUNDI CHANGES CHORIORETINITIS, ETC.
Tertiary Syphilis
Clinical examination Therapy—Tertiary syphilis Later refer patient to—A.
Dictate history and progress notes (typewritten). Index and cross index each day. Photograph selected cases.
OPTIC ATROPHY OCULAR MUSCLE PARALYSIS
Neurological examination Spinal fluid examination (a) Special (Spinal, Head, etc) Later refer patient to—A.
Therapy
Vision, form fields following therapy
INTERSTITIAL KERATITIS
Slit-lamp studies Clinical Signals Fundi studies Therapy—after acute stage refer patient to Clinical Research
Congenital Syphilis
A
Separate day for follow up therapy
Familial Studies
Wassermann Survey Clinical Correlation Therapy

Fig. 1 (Klauder). Plan of Clinic.

embraces familial investigations. It becomes the work of the clinic to conduct a Wassermann survey and examination of the family of patients with interstitial keratitis. The following schematic

* See the paper, Klauder, J. V.: Syphilis and trauma, Jour. Amer. Med. Assoc., 1922, v. 78, pp. 1029-1037.

case record is typical: (Complete history, examination, and familial study are shown in appendix 1.)

B. family*

Father, aged 29 years, refuses treatment, Wassermann reaction 1 plus.
Mother, aged 26 years, pregnant three months, Wassermann reaction 2 plus.
Margaret, aged 7 years, Wassermann reaction 4 plus.
Albert, aged 5 years, patient, has interstitial keratitis, Wassermann reaction 4 plus.
Bobbie, aged 3 years, Wassermann reaction negative.

Margaret, the eldest child, has the typical facies of congenital syphilis. Although she presents no evidence now of interstitial keratitis, she is a potential subject. Since the prevention of syphilitic lesions of the eye is more vital than the curing of them, it becomes part of the work of the clinic to treat such syphilitic brothers and sisters in the pre-interstitial keratitis stage.

Familial studies† greatly aid in the visualization of congenital syphilis, and elicit much that is of clinical value in the study of interstitial keratitis. Case 1 shows how devastating syphilis may be in a family of syphilitic parents, and also records interstitial keratitis in two brothers.

Case 1

Patient: Antonio F., aged 22 years, interstitial keratitis.
Family:
Father, paretic.
Mother, aged 38 years, Wassermann reaction negative.
Carmen, aged 20 years, mental delinquent, in jail.
Dominick, aged 18 years, Wassermann reaction 4 plus, interstitial keratitis.
Nicholas, aged 13 years, Wassermann reaction 4 plus, feeble-minded.
Mary, aged 9 years, Wassermann reaction negative.
Viola, aged 6 years, Wassermann reaction negative.
Frances, aged 4 years, Wassermann reaction negative.

Case 2 on the other hand shows how mildly syphilis may be manifested in the progeny of syphilitic parents. Since the mother had parenchymatous neurosyphilis, her infection doubtless antedated the birth of the eldest child. Interesting features in the case of the child with interstitial keratitis were its appearance after trauma involving the cornea; and the absence of Hutchinson's teeth with the presence of Clutton's joints.

Case 2

Patient: Rose Mary, aged 5 years, interstitial keratitis after trauma, Wassermann reaction 4 plus, teeth negative, Clutton's joints.
Family:
Mother (neurosyphilis), Wassermann reaction 4 plus.
Father, Wassermann reaction 4 plus.
Jack, aged 11 years, Wassermann reaction negative, physical examination negative.
Joe, aged 8 years, Wassermann reaction negative, physical examination negative.
Eugene, aged 3 years, Wassermann reaction negative.
Alice, aged ten months, negative record.

Case 3 is interesting in its visualization of the course of untreated congenital syphilis. The patient's mother has ocular syphilis; her Wassermann reaction is 4 plus. The patient had "sore eyes" when a child, with a history of no internal treatment. Physical examina-

* The importance of treating the entire family is obvious. The father has had no previous treatment. He is within the statistical age of incidence of cardiovascular syphilis and neurosyphilis, syphilitic diseases which incapacitate. Since he is a wage earner, this aspect assumes considerable economic and sociologic importance. In so far as this aspect is concerned the treatment of this family should be ideally under municipal or government control. It is doubtless more economic to treat the wage earner now rather than face the cost of hospitalization if he should become incapacitated through his syphilitic infection. The industrial loss is also prevented. The possibility of the foregoing is represented by the percentage incidence of such syphilitic diseases.

† One must exercise much tact and prudence in order to avoid playing the meddlesome rôle of Gregers in Ibsen's "Wild Duck," and also to avoid producing the symptom complex that characterized Oswald in Ibsen's "Ghosts". I vividly recall one of my patients with interstitial keratitis, a young girl, fully aware of the nature of her ocular condition, whose mental suffering was tragic. I endeavored to reassure her by stating that she might have an affliction much less amenable to treatment, for example tuberculosis. She replied, in the manner of Ibsen's character: "Yes, but it would be much more honorable."

tion is essentially negative; the blood Wassermann reaction is negative. An examination of the cornea with the slit-lamp shows the characteristic appearance of an old interstitial keratitis. It is interesting to note that the interstitial keratitis spontaneously disappeared in the absence of antisyphilitic treatment, and never recurred.

This case emphasizes the value of slit-lamp examination in the study of interstitial keratitis. Such examination may definitely determine the presence of an old interstitial keratitis.

Case 3

Patient: Edna W., aged 27 years, Wassermann reaction negative, physically below par, "sore eyes" when a child, never had antisyphilitic treatment, slit-lamp examination gives characteristic appearance of old interstitial keratitis.
Family:
Mother, aged 57 years, Wassermann reaction 4 plus, under treatment in clinic for uveitis.
Winslow, aged 14 years, Wassermann reaction negative, physical examination negative.
Harold, aged 30 years, Wassermann reaction negative.

Case 4 concerns a patient who has chorioretinitis probably of syphilitic origin and is the father of two daughters who are step-sisters, with interstitial keratitis. The evidence supports the belief that his infection was transmitted through two wives, over a period of seven years. Certainly four of his six children were infected.

Case 4

Patient: Jacob Z., aged 46 years, no history, chorioretinitis, physical examination negative, Wassermann reaction negative.
Family:
First wife, dead. Her children:
Carral, aged 17 years, Wassermann reaction positive.
Gladys, aged 12 years, interstitial keratitis, Wassermann reaction 4 plus, physical examination negative.
John, aged 9 years, Wassermann reaction 1 plus, physical examination negative.
Second wife, Wassermann reaction plus 4.
Second wife's children:
(One miscarriage)
Viola May, aged 7 years, interstitial keratitis, Wassermann reaction 4 plus, typical facies.
Ethel, aged 5 years, Wassermann reaction 4 plus.
Beatrice, aged 2 years, Wassermann reaction negative.

Neurosyphilis

This is notably represented by patients having optic atrophy and oculomotor paralysis. The procedure of history taking and physical examination, the latter essentially including neurologic examination and determination of any physical hazards to treatment, is shown as a case-record in appendix 2. A routine examination of the spinal fluid of these patients is performed. Patients with optic atrophy and patients receiving tryparsamide have their form fields and vision determined at frequent intervals as a guide to treatment. The patients receiving special therapy, such as intraspinal treatment or fever therapy, are admitted to the hospital.

The patient whose case record is shown as appendix 2 had a rapidly progressing optic atrophy which eventuated in blindness in the course of six months. The effectiveness of antisyphilitic treatment in optic atrophy is intimately related to how early the patient is treated. With the majority of patients, their vision at the time of their first visit to the clinic is so impaired that the prognosis under the most intensive treatment is bad.

Case 5 concerns a patient with neurosyphilis as well as visceral syphilis. The syphilitic hepatits contraindicated the employment of arsenic. The patient greatly improved following the administration of bismuth, mercury, and potassium iodide. This case emphasizes the importance of examining the patient before beginning antisyphilitic treatment.

Case 5

Mary M., age fifty-one years: total third nerve paralysis, cerebrospinal syphilis, and syphilitic hepatitis; blood and spinal fluid positive; treated with bismuth, Hg, and KI.

Tertiary syphilis

Patients with tertiary syphilis notably include those with uveitis, those

with pathologic changes in the fundi, those with preoperative positive Wassermann reactions, and those with positive Wassermann reactions whose ocular lesion is nonsyphilitic or doubtfully of syphilitic origin. These patients are examined for general evidence of syphilis and also to determine their fitness for treatment.

The case record of a patient in the tertiary stage of syphilis with chorioretinitis is shown as appendix 3.

Intensive treatment of patients in this group is generally not indicated, indeed it is contraindicated in many because they are above middle age. In this group it is necessary to fit therapy to the patient.

Secondary and late secondary syphilis

This stage of the disease is notably represented by patients with uveitis. According to Gilbert's[1] statistics, fifteen percent of all diseases of the anterior uveal tract are of syphilitic causation. Iritis is conspicuous among the syphilitic eye diseases of acquired syphilis. Of Groenouw's[2] study of 2020 cases of syphilitic eye diseases, iritis was present in 44.7 percent. The majority of patients with iritis due to acquired syphilis are in the first year of the infection, and they frequently present cutaneous and mucous membrane lesions of early syphilis. The age of incidence in these patients is between twenty and forty. They are therefore less likely to present therapeutic risks. A standard formula of treatment is more likely to be carried out than in any of the other groups herein discussed.

"Follow-up" system in therapy

That phase of social service work concerning notification of patients who are delinquent in attendance or who lapse treatment, and the transferring of patients to clinics in other cities, is similar to that carried out in other clinics and needs no further comment.

Another phase of "follow-up" system concerns the transfer of some patients for various reasons to their family physician, who is asked to continue the proposed plan of treatment. The patient returns to the clinic at stated periods for observation.

Treatment

The purpose of this paper is to discuss the therapy of ocular syphilis only in a general way. It becomes apparent from the foregoing that a standard formula of treatment suitable to all patients is not practicable. Obviously, the treatment of a child wtih interstitial keratitis differs from that of a patient with optic atrophy, or from that of a patient above middle age whose Wassermann reaction is positive and yet whose ocular lesion doubtfully is of syphilitic origin from the clinical viewpoint. The choice of antisyphilitic drug, dosage, the interval of treatment, and the problem of conjoint treatment are intimately related to the age of the patient, the urgency of the case, and the physical condition of the patient. Intolerance of the patient to the drug selected necessitates a modification of dosage or the employment of another drug.

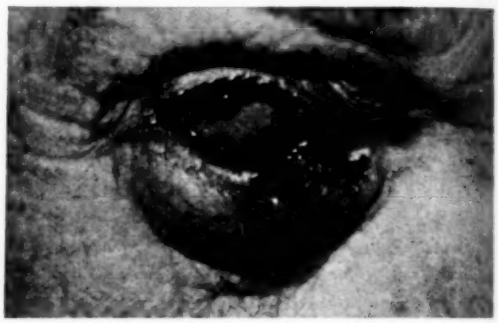

Fig. 2 (Klauder). Showing a chancre of the lid in a woman aged sixty years. The floor was ulcerative and inflammatory, with considerable surrounding edema. There was no induration. The patient was ignorant as to the mode of infection; there was no clue from the history. Spirochetæ pallidæ were found in the dark field examination, and the Wassermann reaction was positive. The lesion promptly underwent involution after antisyphilitic treatment.

All of the following drugs are employed: neoarsphenamine and sulphar-

sphenamine (intramuscularly and intravenously), tryparsamide, mercury (by different routes of administration), iodides (orally and intravenously), bismuth (intravenously and intramuscularly), bismarsen (arsenical bismuth preparation), foreign protein therapy (sterile milk intramuscularly), fever therapy, intraspinal therapy. Means to improve the general state of health of the patient are important adjuncts to antisyphilitic treatment.

Potassium iodide is routinely administered to all patients. Sodium iodide is administered intravenously to some patients with interstitial keratitis and to some patients with neurosyphilis, notably those with oculomotor paralysis which does not readily disappear following other treatment. Mercury is chiefly employed in those patients who are intolerant to the arsenicals. Bismuth is highly regarded as an active and relatively nontoxic spirocheticidal drug. It is frequently employed in all of the groups discussed, most often intramuscularly, and in some patients, in addition, intravenously. An intravenous injection of ten milligrams of colloidal bismuth appears to be as effective clinically as many times that amount of neoarsphenamine. Bismuth, intramuscularly and intravenously, is particularly favored in the treatment of interstitial keratitis. Intramuscularly it is frequently the choice of method in treatment of patients over middle age who are poor therapeutic risks to the arsenicals and to mercury.

Neoarsphenamine is employed in relatively small doses, 0.3 to 0.6 gm. Sulpharsphenamine and tryparsamide are administered to patients with neurosyphilis. Patients with optic atrophy are treated with a combination of antisyphilitic drugs as intensively as their tolerance and physical condition will permit. Also, fever therapy and intraspinal therapy (Swift-Ellis) are employed.

Our studies of the response of interstitial keratitis to antisyphilitic treatment, to be later published, show that involvement of the other eye while the patient is under treatment is not a biologic occurrence, as has been thought by some, but intimately concerns the lack of sufficiently intensive treatment.

Our studies show that treatment solely by mercury is not sufficient to prevent involvement of the other eye nor to prevent recurrence of the involved eye. By employing a formula of treatment which is not intensive enough to be hazardous to the patient's health, we have reduced involvement of the other eye to about six percent, and by continued treatment have prevented recurrence in the involved eye.

1934 Spruce street.

Appendix 1: Example of a "congenital syphilis" form.

WILLS HOSPITAL
TREATMENT CLINIC

(Congenital Syphilis)

Date Referred 4-16-28
Referred by Dr. Griscom
Referred to Dr. Klauder
Patient's Name A. B.
Address
Age 5 Book 52 Page 43
Ward Case ×
Clinic Case
Ocular Diagnosis: Interstitial keratitis (congenital syphilis)

Family History. (Parents: stillbirths, miscarriages, cause of death. Name and age of brothers and sisters. Interstitial keratitis among brothers and sisters.)

Father and mother living and well. Mother had one miscarriage (between Albert and Bobbie). No stillbirths. None dead. Three living children: Margaret, age 7; Albert, age 5, (patient); Bobbie, age 3. The other two children have never had eye trouble. Margaret is a delicate child. Father and mother are well. Never had blood test.

Patient's History. (Onset, one or both eyes chronologically. Previous treatment. Involvement of other eye under treatment.)

Albert was 2½ years of age when trouble first began with his eyes. At that time they became crossed and after three months he began wearing glasses. Inflammation in both eyes set in when he was 3 years of age.

Eye Examination.

Lids and sacs R. and L. normal.

O.D. Conjunctiva slightly injected. Cornea is slightly infiltrated. Much lacrimation and photophobia. Anterior chamber normal depth. Pupil dilated. Iris

appears normal. Unable to see fundus because of blepharospasm.
O.S. Much more photophobia than O.D. Conjunctiva injected. Marked ciliary injection. Cornea diffusely clouded with central opacity very dense. Anterior chamber normal depth. Unable to examine very thoroughly because of blepharospasm. Unable to see fundus.
Physical Examination. (Stigmata of congenital syphilis; facies, teeth, deafness, bones and joints. Heart, liver, spleen, neurologic.)
Much below weight and height for age.
Typical facies, prominent forehead.
Ill-nourished and ill-formed teeth, not typical Hutchinsonian.
Bones and joints negative.
Liver and spleen not palpable.

Examination of Parents and Siblings. (Parents: ocular, cardiovascular, neurologic. Siblings: ocular, stigmata of congenital syphilis.)
6-6-28. Father, age 29. W.R. 1 — — — Meinicke 2 plus
Mother, age 26 W. R. 21 — — Meinicke 4 plus
Margaret, age 7, (sister) W.R. 4442 — Meinicke plus
Well nourished, normal stature
Facies of congenital syphilis
Hutchinsonian teeth
Cervical and inguinal adenopathy bilateral
Bones and joints negative
Bobbie, age 3, (brother) W.R. and Meinicke negative
Ocular examination negative
Facies and teeth negative
Liver and spleen not enlarged
Bones and joints negative

Progress Notes. (Details of this record are omitted here.)

Laboratory tests

4- 2-28.	Wassermann	4 plus
	Meinicke	4 plus
6-10-29.	Wassermann	44411
	Meinicke	4 plus
4-23-28.	Differential count:	
	Polys.	47%
	S. Lymphs.	44%
	L. Lymphs.	7%
	Trans.	2%
	Mono.	0%
	Baso.	0%
	Eosin	0%

4-23-28. Urine sugar: negative

Treatment

Weekly injections of 0.05 gm. bismuth hydroxide.
Potassium iodide by mouth, 5 drops t.i.d.
4-16-28. 0.05 gm. Bismuth
4-23-28. 0.05 gm. Bismuth
4-30-28. 0.05 gm. Bismuth
5- 7-28. 0.05 gm. Bismuth
5-14-28. 0.05 gm. Bismuth
5-21-28. 0.05 gm. Bismuth
5-28-28. 0.05 gm. Bismuth
(And so on, with several intermissions, until 7-1-29.)

Appendix 2: Example of a "neurosyphilis" form.

(Preliminary details are here omitted.)

Ocular Diagnosis: Primary optic atrophy (tabes)

Vision:
6- 3-29. 02 5/60
9-23-29. O.D. Nil
O.S. L.P.

Patient's History: (Infection. Previous treatment, nature and duration. Onset of symptoms; initial ones.)
Two months ago first noticed mist before eyes, since which time vision has gradually failed.
History of probable infection 12 years ago. Patient claims scar on right arm was site of chancre.
Treatment by mouth for a short time 12 years ago. None since. No previous blood test. Has always been in good health.
Wife died in child-birth. Four living children, all healthy. No miscarriages; no stillbirths.

Neurologic: (Pupils, station, gait, reflexes.)
Absent patellar reflexes and ankle reflexes. Romberg sign.

Eye Examination:
Both pupils are irregular. No reaction to light. React to accommodation. Disc is very pale, grayish in color. Margins well defined. Central cup with lamina plainly visible. Vessels contracted. No other pathologic changes in fundi.

Physical Examination: (Note especially therapeutic risk.)
Physical condition good.
Heart and lungs essentially negative. Heart sounds good quality, no murmurs.
Abdomen negative.
Blood pressure 110/75.

Progress Notes: (Ocular response to treatment. Subjective improvement. Systemic reactions to treatment. Repeat examination urine, blood, and spinal fluid.)
6- 3-29. Patient lives out of town and it is very difficult to carry out intensive treatment. In view of the rapid progress of the atrophy, the prognosis under any form of treatment is bad.

7-15-29. No systemic reactions. Is tolerating treatment very well. Patient states vision is worse.
8-19-29. No systemic reactions to treatment.
9-23-29. Is tolerating treatment well.

Laboratory tests

6- 3-29. Wassermann 442
Meinicke 4 plus

6- 3-29. **Spinal fluid:**

Lymphocytes	14
Globulin	4 plus
Gold solution	4521000000
W. R.	44441
Meinicke	4 plus

6-10-29. **Urinalysis**
Sp. gr. 1.020
Reaction. Slight acid
Sugar. Negative
Albumen. Very faint trace
Microscopical:
Occasional leucocyte
Occasional epithelial cell

Treatment

Potassium iodide by mouth. Increase up to 100 grains daily.
6- 6-29. 0.2 gm. Bismuth hydroxide
6-10-29. 0.3 gm. Neoarsphenamin
6-17-29. 0.6 gm. Neoarsphenamin
0.2 gm. Bismuth hydroxide
6-24-29. 0.6 gm. Neoarsphenamin
0.2 gm. Bismuth hydroxide
7- 1-29. 0.2 gm. Bismuth hydroxide
7- 8-29. 0.2 gm. Bismuth hydroxide
7-15-29. 0.2 gm. Bismuth hydroxide
7-22-29. 0.6 gm. Neoarsphenamin
0.2 gm. Bismuth hydroxide
(And so on, until 9-23-29.)

Appendix 3: Example of a "general syphilis" form.

(Preliminary details are here omitted.)

Ocular Diagnosis: Exudative choroiditis (tertiary syphilis)

Patient's History. (Infection. Previous treatment, nature and duration. Marital history; spouse, miscarriages, siblings.)
Infection four years ago. No treatment. Six months ago had iritis, disappeared. Present trouble four weeks ago. No previous treatment. Is unmarried.

Eye Examination.
O.D. Essentially negative.
O.S. No conjunctival injection, no ciliary injection. Cornea clear. Anterior chamber normal depth. Iris good color and texture. Pupil irregularly dilated and fixed (mydriatic). Numerous posterior synechiæ especially below. Numerous fine pigmented deposits on the anterior capsule of lens. Media hazy with many vitreous opacities. Fundus indistinctly seen. Disc good color and outlines distinct. There is a discreet subacute choroiditis located mostly in the macular region, although scattered almost throughout the whole fundus. There is evidence of arteriosclerosis with marked irregularity of the superior temporal artery.

Physical Examination. (Recent infection; acute symptoms of syphilis. Old infection. Cardiovascular. Neurologic. Examination for therapy risk.)

Heart normal in outline. Sounds are normal. Liver not palpable. Patellar reflexes are active.

Progress Notes: (Ocular response to treatment. Systemic reactions to treatment. Repeat examination urine and Wassermann reaction.)
7-16-28. No inflammatory reaction O.S. Condition much improved. No reaction after treatment.
9-10-28. Eyes appear negative.
11-19-28. To rest one month from injections.
1-28-29. Exam. O.S. There is no evidence of external congestion. The anterior chamber is normal depth. Iris normal color. Pupil is regular in outline and reacts to light. No posterior synechiæ at present. The vitreous appears to be very much clearer than on the first examination, so that the fundus is seen fairly distinctly. The disc is of good color and the margins well defined. There are still evidences of choroiditis around the temporal margins of the disc, and extending out to the macular region. There is not much pigmentation in this area. This inflammatory condition of the choroid involves most of the fundus but is not as marked as in the macular region.
O.D. Negative upon examination.
3-11-29. To rest six weeks from injections. Continue drops by mouth. Upon return, to receive a course of bismuth, 0.2.gm. weekly.
7- 8-29. No conjunctival injection. Fundus is better seen than previously. There still appears to be a subacute choroiditis scattered throughout the whole fundus. Is tolerating injections. To rest for one month from injections. Continue potassium iodide.
8- 5-29. Several patches of old choroiditis throughout fundus in O.S. Patel-

lar reflexes exaggerated. Pupils equal and react normally to light. Resume treatment. 2 gm. bismuth weekly.

9-12-29. In good general condition. No reaction after treatment.

Laboratory Tests

5-18-28. Wassermann 4 plus

3-11-29. Wassermann 321 — —

5- 6-29. Wassermann 43 — — —
Meinicke 3 plus

8- 5-29. Wassermann 21 — — —
Meinicke 1 plus

6-11-28. Urinalysis:
Albumen negative
Sugar negative
Reaction acid
Sp. gr. 1015
Microscopical:
Amorphous urates

Treatment

6- 4-28. .6 gm. Neoarsphenamin
6-11-28. .6 gm. Neoarsphenamin
6-18-28. .6 gm. Neoarsphenamin
6-25-28. .6 gm. Neoarsphenamin
7- 2-28. .6 gm. Neoarsphenamin
7- 9-28. .6 gm. Neoarsphenamin
7-16-28. .6 gm. Neoarsphenamin
7-23-28. .6 gm. Neoarsphenamin
7-30-28. .6 gm. Neoarsphenamin
8- 6-28. .6 gm. Neoarsphenamin
8-13-28. .6 gm. Neoarsphenamin
8-20-28. .6 gm. Neoarsphenamin
8-27-28. .1 gm. Bismuth hydroxide
9-10-28. .1 gm. Bismuth hydroxide
9-17-28. .1 gm. Bismuth hydroxide
9-24-28. .1 gm. Bismuth hydroxide
10- 1-28. .1 gm. Bismuth hydroxide
10- 8-28. .1 gm. Bismuth hydroxide
10-15-28. .1 gm. Bismuth hydroxide
(And so on, in alternating series, until 9-30-29.)

References

[1] Gilbert. Quoted from Igersheimer, J., "Syphilis and eye", second edition, page 205; Springer, Berlin, 1928.
[2] Groenouw. The same, page 205.

A CASE OF TUBERCULOUS RETINITIS

Microscopical findings of one eye and results of tuberculin therapy upon the other

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One eye was enucleated after the sight had been lost from chronic uveitis. Microscopic evidence of tuberculosis was found in the enucleated eye; and this, with other evidence, including a positive tuberculin reaction, was accepted as strongly supporting the belief that recurrent hemorrhages in the other eye were due to tuberculosis. Under minute, progressive doses of tuberculin the second eye recovered completely from the hemorrhagic process. From the Wilmer Ophthalmological Institute, Johns Hopkins Hospital.

This constitutes a report of a case with such important clinical and pathological findings that apparently positive knowledge is derived.

Since many ophthalmologists are still doubtful as to the value of tuberculin therapy, and since most cases that are cured or arrested by this line of therapy are diagnosed chiefly by elimination, it seems expedient to report this case which proves, as far as one can prove in cases of tuberculosis of the eye, both the correctness of the diagnosis and the efficacy of the treatment.

Case history: October 28, 1926. J. B., aged eighteen years, white male.

Family history: Stepfather has had some lung disorder which was thought to be due to gassing during the World War. Mother is living and well. One half-brother and three sisters are living and well*.

Past history: The patient had the usual diseases of childhood. He suffered a compound fracture of the right femur at the age of seven years without complications. There was a dislocation of the left shoulder at the age of fifteen years, and Neisserian infection in 1921 and 1925. The patient was struck in the left eye four years ago by a baseball; two months later he noticed dimness of both eyes, and he was treated by a local oculist under whose care the right eye cleared up, but the left eye became progressively worse. In January, 1925, the patient states he went to the University of Pennsylvania Hospital, where he was informed that the right eye was involved. He left the hospital after a period of seven weeks, and experienced no difficulty until October 26, 1926, when he noticed marked blurring of the right eye. On October 28, 1926, he came to Baltimore and was seen in the out-patient department of the Wilmer Institute.

Recent history: The patient has noticed a cloud in front of the right eye for two days. The left eye has been blind for some time.

External examination: The right eye shows normal lids; conjunctiva not injected; cornea clear; anterior chamber normal; tension normal; pupil reacts to light and accommodation; vision 20/30. The left eye shows conjunctiva and lids normal; cornea clear, but limbus margin irregular; pupil is irregular, is completely bound down to an opaque lens, and does not react to light; iris is somewhat atrophic; finger tension is soft; vision no light perception.

Ophthalmoscopically: Right vitreous shows both small and large opacities: outlines of nerve blurred; veins engorged; in the lower nasal quadrant are large fresh hemorrhages with numerous exudates, especially along the vessels; some older areas of chorioretinal atrophy with disturbance of pigment are seen. Left eye fundus not seen, due to opaque lens.

Slit-lamp: Right eye shows a very faint superficial opacity of the cornea down and in; granular opacities in the vitreous. Left cornea shows striate opacities (folds of Descemet's) in lower

* January 1, 1929. The mother has recently died of tuberculosis, and the stepfather and one sister have active tuberculosis.

part; iris is atrophic, with complete posterior synechia and with pigment deposits on anterior capsule; some thickening at lower angle of anterior chamber.

The patient entered the Wilmer Institute for survey and treatment on October 30, 1926. A general survey showed the following: Few râles in chest due to an acute cold. Right lobe compresses every two hours, with one percent atropin solution three times a day.

The patient was discharged from the hospital on November 25, 1926, with a note stating that there were still opacities in the vitreous and hemorrhages in the lower part of the fundus. Vision O.D. 20/40; with —0.75 sph. —0.25 cyl. ax. 30° = 20/15.

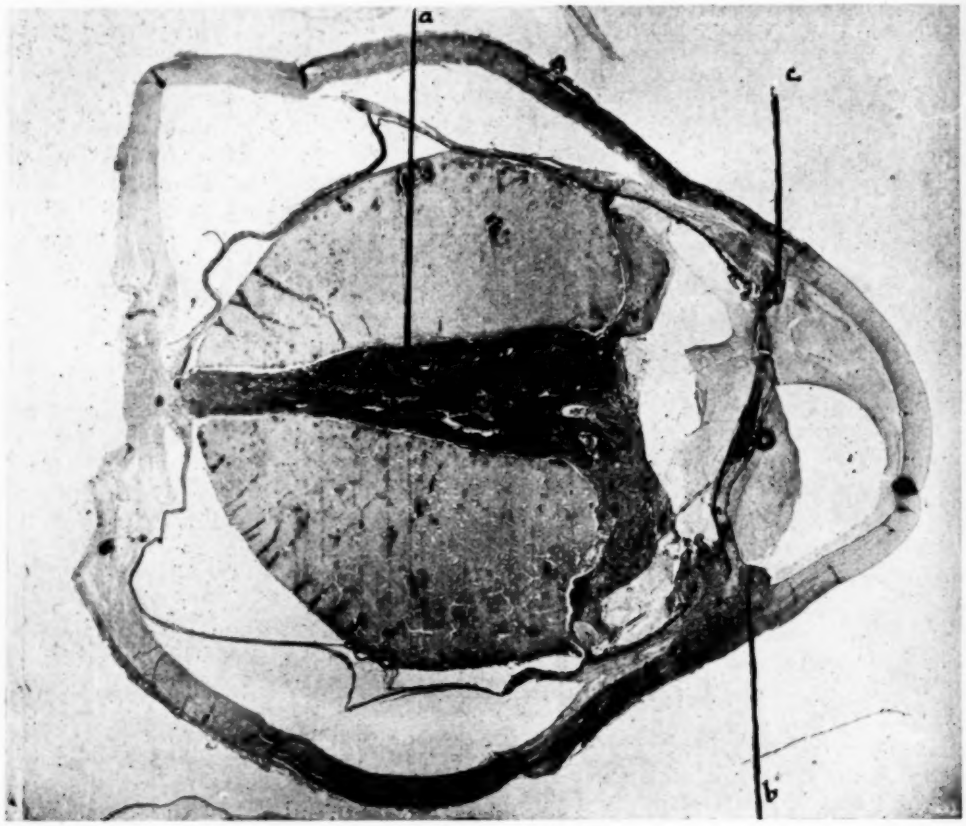

Fig. 1 (Clapp). Vertical section through the eye showing: (a) complete detachment of the retina; (b) thickening in the region of the angle below; (c) iris stump above.

of prostate slightly enlarged and somewhat tender. Phthalein test shows sixty percent elimination in two hours. Blood analysis negative. Lens protein test negative. Uveal pigment test negative. Intradermal tuberculin test 0.001 mg. negative. X-ray report: Sinuses clear. Chest, root shadows accentuated and right apex slightly infiltrated. While in the hospital he received hot

The patient went to his home in Delaware, but returned to the out-patient department on December 11, 1926, with vision in O.D. 20/20, and still with very large hemorrhages in the lower part of the fundus. In spite of the negative tuberculin test while in the hospital, the patient was sent to the protein clinic for a retest, where it was found that he had a marked reaction to 0.0001

mg. The patient was started on tuberculin therapy, receiving 0.000001 mg. of bacillary filtrate on December 14, 1926, and the dose was gradually increased until June, 1927, when he received 1.25 mg. bacillary filtrate. During December, 1926, and January, 1927, the hemorrhages underwent rapid absorption. On February 8, 1927, the pupil was dilated and no hemorrhages could be found, although some retinitis proliferans was noted in the eye downward and outward. His vision on May 28, 1927, was 20/15.

On June 18, 1927, the patient asked that the cataract be removed from the left eye. It was explained to him that an operation of this character might be followed by inflammation which might require enucleation. In spite of this explanation he requested the operation. He was readmitted to the Wilmer Institute on June 18, 1927, and on June 25, 1927, the cataract was removed. The eye remained red but the patient was discharged on July 5, 1927. He reported to the out-patient department regularly, but the eye became more red and painful, so that on August 9, 1927, enucleation of the left eye was advised. The patient was admitted to the hospital August 14, 1927, and the left eye was enucleated August 22, 1927. The patient was discharged September 4, 1927, with the left stump free from irritation and the right eye quiet.

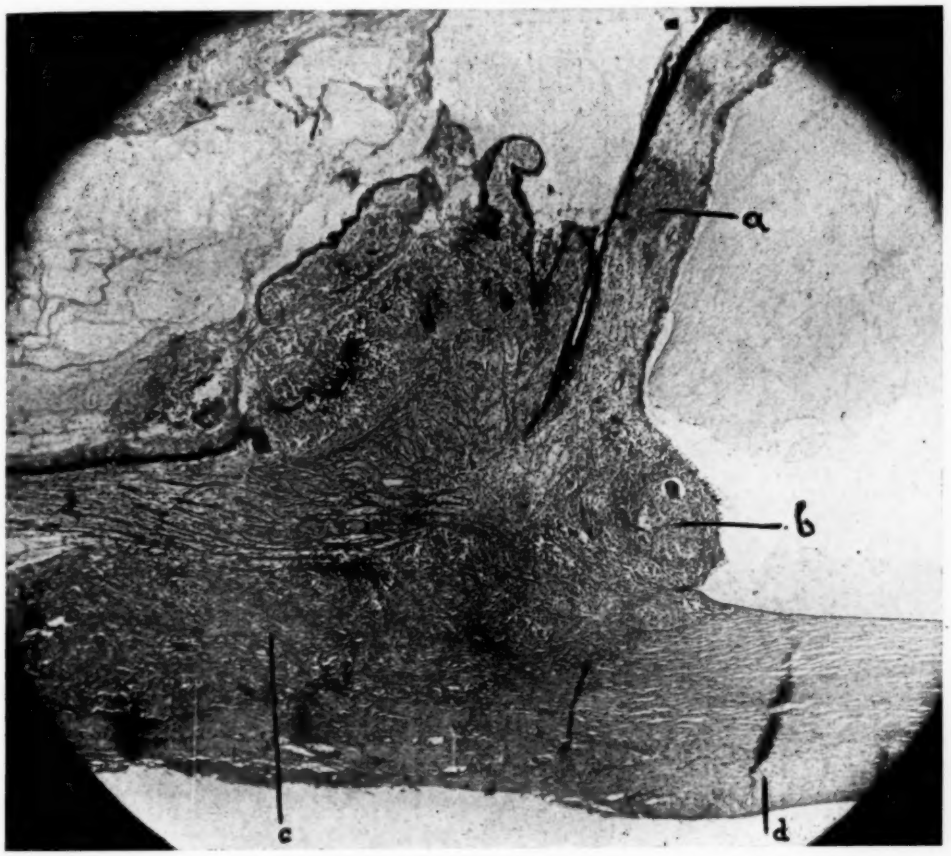

Fig. 2 (Clapp). The corneo-iridic angle magnified thirty-six times, showing: (a) iris with localized area of infiltration; (b) tuberculous tissue in angle; (c) degeneration extending into inner layers of sclera; (d) infiltration into superficial area of cornea.

Pathological report of left eye

Macroscopic examination:

A vertical section of the left eye shows complete detachment of the retina, with much thickening at the lower corneo-iridic angle; lens opaque; iris adherent to the anterior lens capsule.

Microscopic examination:

The corneal epithelium is normal except at its lower margin, where it covers an area of keratitis; at this point there are areas which are quite thin and other areas thickened. The substantia propria shows very definite inflammation near the lower limbus, chiefly in the region of Bowman's membrane, at which point there is a large cellular infiltration composed chiefly of lymphocytes and polymorphonuclear leucocytes. There are a few deeper areas of circumscribed infiltration consisting largely of lymphocytes, and a few points just beneath Descemet's membrane show a similar picture. Near the upper limbus a scar is seen where the cornea was incised for the cataract extraction. The anterior chamber is filled with a fibrinlike material in which are numerous polymorphonuclear leucocytes.

Iris: A stump of iris tissue remains above, which contains new-formed vessels and numerous cells of the mononuclear form, both large and small. The section of the lower part of the iris shows a nodular infiltration of round cells located about halfway between the pupillary margin and the iris root. Numerous new-formed vessels are present in the iris proper, and there has been a migration of pigment granules. At the corneo-iridic angle there is found a rather large nodular mass con-

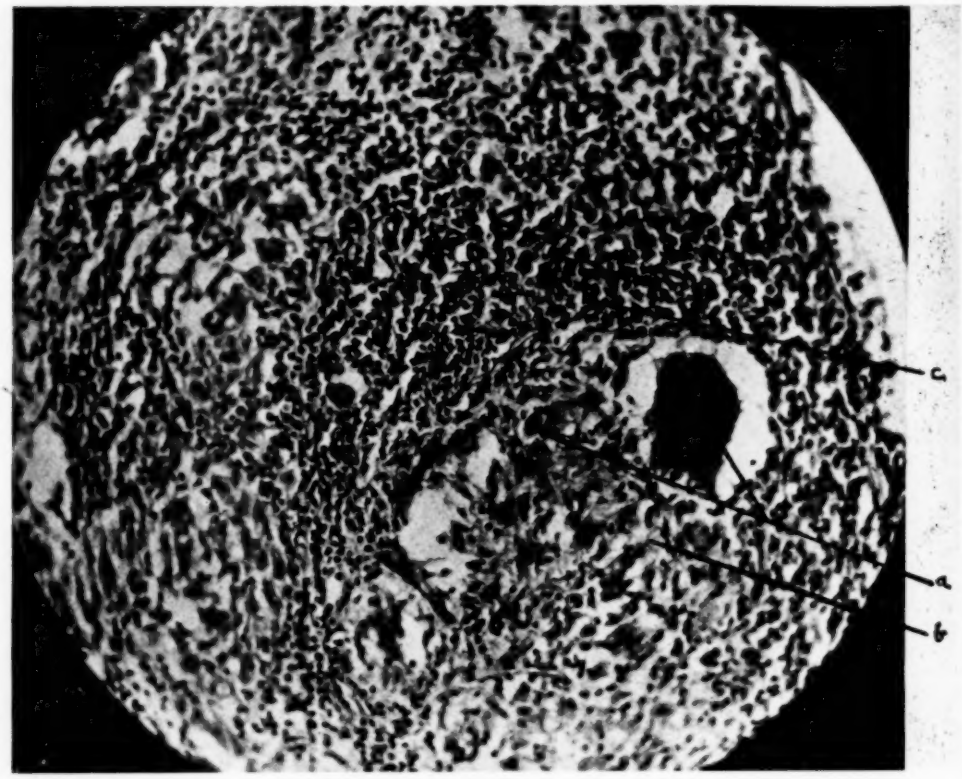

Fig. 3 (Clapp). Tuberculous tissue at corneo-iridic angle magnified two hundred and eighty times: (a) giant cells both large and small; (b) epithelioid cells; (c) lymphocytes.

sisting of lymphocytes surrounding epithelioid cells, in the center of which are found both large and small giant cells. This area of infiltration extends outward, involving about one-half of the sclera. The ciliary body, which is sectioned above, shows some cellular infiltration, while the processes are practically normal. The lower part of the ciliary body has been involved so extensively in the process that very little normal tissue can be demonstrated.

The sclera is infiltrated in its inner half at the lower corneoscleral junction, and this infiltration extends backward to just beyond the ciliary body. Another small area of infiltration is seen far back near the optic nerve.

The vitreous chamber is filled in the central region with detached retina which has undergone degeneration, so that no normal retina can be differentiated. The choroid shows large areas filled with erythrocytes and many leucocytes and round cells.

In view of the microscopical findings in the left eye, I think one is justified in claiming that in this case we have found conditions which make the diagnosis of tuberculous retinitis of the right eye as certain a diagnosis as can be made without an actual microscopical examination of that tissue; such examination is obviously inexpedient.

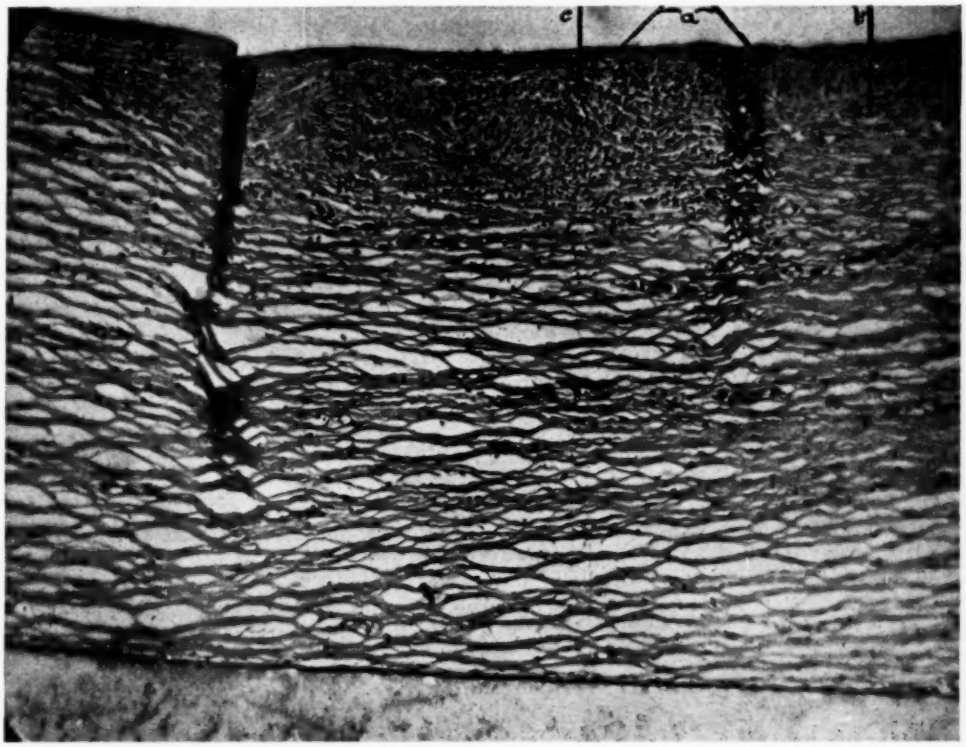

Fig. 4 (Clapp). Area of superficial keratitis magnified one hundred and forty-five times: (a) variations in depth of epithelial layer; (b) new-formed vessels; (c) mononuclear cells.

The following reasons may be summarized as giving a basis for a diagnosis of tuberculous retinitis:

(1) The clinical diagnosis of hemorrhagic retinitis in a young adult.

(2) The almost completely negative physical examination which would account for such hemorrhages.

(3) The high skin sensitivity to tuberculin when properly given.

(4) The very satisfactory absorption

of all of the hemorrhages under tuberculin therapy.

(5) The tuberculous process in the left eye as found when studied with the microscope.

This case also exemplifies the fact that great care must be exercised in the technique of the tuberculin skin test. The first test, which was negative and therefore quite misleading, was performed by a resident interne, but this test was not accepted as final since the clinical appearance was so suggestive. When a second test was given by a man of experience, the tuberculin sensitivity was found to be very marked with 0.0001 mg., a reaction which pointed very strongly to a tuberculous nature of the lesion.

Another lesson which may be learned from this case relates to the prognosis in operating upon soft degenerated eyes. It reaffirms the generally accepted opinion that this class of cases should not be operated upon. Such eyes should usually either be left alone or enucleated. However, since in this case enucleation had previously been advised, the ultimate outcome was desirable.

This case also shows that in tuberculin therapy one should not be discouraged by slow results. This patient was under treatment for six months, although there was very definite improvement after two weeks of treatment, and in two months all the hemorrhages were absorbed.

The question as to whether tuberculin treatment is of real value in such lesions of the eye, or only an aid in the psychological handling of the case, seems to be quite definitely settled in this instance. The left eye was lost with a tuberculous lesion. This eye undoubtedly had the same local treatment that the right eye received after the latter became affected. The right eye showed consistent improvement only after tuberculin therapy was started, and under its use the lesion seemed to be entirely healed.

Conclusions

(1) Profuse retinal hemorrhage in young adults is usually the result of tuberculosis.

(2) Great care must be exercised in giving the intradermal tuberculin test, as an erroneous interpretation may alter the diagnosis.

(3) Tuberculous retinal lesions are usually benefited and are often entirely healed by tuberculin therapy when the tuberculin is given in properly graduated doses and under very careful supervision.

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COMBINED IRIDENCLEISIS AND SCLERECTOMY FOR CHRONIC GLAUCOMA

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A well performed combination of iridencleisis and sclerectomy will almost invariably yield a good filtering cicatrix, and almost always without massage. The technique described includes dissection of a conjunctival flap, a short scleral incision one millimeter outside the limbus with a small narrow Graefe knife, excision of a piece of the scleral lip with punch or scissors, and the leaving of a smoothly inverted iris flap upon the sclera beneath the conjunctival flap after a meridional snip in the iris to one side of the iris forceps.
Read before the New England Ophthalmological Society, November 19, 1929.

There is no royal road to success in operating for chronic glaucoma. With any operation there is always the possibility of hemorrhage, choroidal separation, cataract, iridocyclitis, or stoppage of the filtration.

Several of these complications or sequelæ may be combined to rob the patient of the hoped-for relief and disappoint and dishearten the optimistic operator. Besides the operative complications and early sequelæ there may be late sequelæ which lessen the good result or destroy the eye altogether.

In many of the cases of simple glaucoma with considerable nerve involvement, especially in the typical noncongestive cases, there may be a gradual loss of function of the optic nerve in spite of the low tension obtained, and blindness may ensue.

Then there is the possibility of late infection, of which the writer has seen three cases. I am convinced that this late infection is less prevalent today as a result of the efforts to make the conjunctival flap include the subconjunctival tissues, and also on account of the fact that most operators today have their patients continue the use of some antiseptic solution after the operation.

As these late infections often occur from one to several years after the operation and may result in severe panophthalmitis, they constitute perhaps the most dreaded and disheartening of the late sequelæ. Statistics would seem to prove that this late infection is more likely to occur after the trephining operation than after any of the other operations that produce a filtering cicatrix. This has caused some of the best operators to give up a trephining except in selected cases.

I have come to feel, however, that the trephining operation is the surest operation that is done for chronic glaucoma, and for some of the cases with deep anterior chamber and low tension in young people it is the operation of choice. For the congestive type of glaucoma, particularly in older people with shallow anterior chamber, I have had rather better results from the operation to be described.

One of the best operators in this country recently, in lecturing on this subject, remarked that in his hands the regular Lagrange operation had been the most satisfying. We all know that Dr. John Weeks of New York, who used to be one of our leading operators, used the Lagrange operation. It happens that I was one of the early advocates of the Lagrange operation in this country, and I still use it occasionally.

One of our older members, Dr. Harrower of Worcester, was one of the early men in this country to advocate the Borthen operation of iridotasis, which for many surgeons in America is today the operation of choice. This operation has been, as you know, modified by some surgeons, who make a snip in the sphincter muscle to make sure that the iris will not be pulled back into the anterior chamber. Some have advocated that a double snip be made, cutting far enough down into the muscle to insure that the two side portions of the iris will return to the anterior chamber, making a definite coloboma. The middle section in the grasp of the forceps is smoothed out as a

tongue with the black surface uppermost. This acts as a seton, and doubly so in view of the fact that the endothelial layer does not readily adhere to the sclerocorneal wound.

In the operation which I have been doing the last few years in the majority of my cases this procedure is followed, and combined with it there is a removal of a good-sized single or double bit taken out of the anterior scleral lip. Several times, instead of leaving the tongue of iris under the conjunctival flap I have cut the tongue off at its base, thus making the operation more of a straight Lagrange type. The method of cutting the iris down on each side gives a very good looking narrow coloboma whether the tongue of iris be left under the conjunctival flap or removed.

A well-performed combination of iridencleisis and sclerectomy will almost invariably yield a good filtering cicatrix, and almost always without the aid of massage. With the exception of two cases, my results with this operation have been extremely satisfactory, and I have performed the operation several times on an only eye, the other having been previously lost from untreated glaucoma. All of these one-eyed patients have done well, and several of them have returned to their occupations. As one method of producing a filtering cicatrix in cases of chronic glaucoma I commend it to your consideration. I have never seen a case of hypotony follow this operation.

In any type of operation for chronic glaucoma you must expect your best results the earlier in the course of the disease the operation is performed, remembering that there is a constantly increasing adherence of the iris to the back of the cornea in all types of glaucoma, and the more completely this has taken place the less likely is the operation to be a perfect success; if indeed one may speak of a perfect success in any glaucoma operation, for the new filtration of fluid from the anterior chamber into the subconjunctival lymph spaces can never replace the normal filtration.

The filtering cicatrix is always more or less of an annoyance to patients, and there is, of course, the need of the constant use of some antiseptic solution during the remainder of their lives. But these discomforts are in no way to be compared with the loss of vision, and I wish to urge my hearers not to put off their operative interference too long, except in very old people where it is justifiable to take a chance of holding, by using miotics, enough vision for them to get around as long as they live. I can only recall three times in my experience when I have deeply regretted doing an operation for chronic glaucoma, but I can recall many cases where I have regretted not doing it earlier.

The following is a brief description of the operation which I have recently, as noted above, found to give me very gratifying results in cases for which the operation was best adapted, namely those with fairly high tension and of the congested type in people in middle life or beyond.

The preparation of the patient is that followed for a cataract operation, and as these are not emergency operations ample time is available to have the patient properly prepared. At the time of operation full local anesthesia such as I give for my cataract operations is used for these patients. The Van Lint injections into the lids are followed by the deep orbital injection in the region of the ciliary ganglion, this latter injection going in on the nasal side just above the ligament. The conjunctiva is infiltrated deeply in the region of the inferior rectus muscle and enough novocaine is injected in the conjunctiva above and along the superior rectus muscle to give complete anesthesia in this region.

A conjunctival flap is then made fairly high up, the same as would be made for a trephining, and separated from the sclera with as little cutting as possible, being especially careful that the subconjunctival tissue is incorporated in the flap. The lifting up of the conjunctiva by the injection of novocaine makes the forming of this flap much easier. The flap is undermined

at each side so that it can be easily turned down over the cornea. No attempt is made to split the corneal tissue as in the Elliot operation.

After this flap is made, a small narrow-bladed Graefe knife is inserted about two millimeters from the apex of the cornea and about one millimeter back in the white sclera. It is thrust in at a right angle to the curve of the cornea until the point appears in the anterior chamber. The knife is then carried across the anterior chamber in a horizontal position with the back of the knife nearly resting on the iris. The point is next carried deeply into the angle of the anterior chamber for the counterpuncture, which comes out a little farther back in the sclera than the puncture.

Care should be taken to let the aqueous out slowly as the incision is finished, this being done with the knife turned slightly backward so as to make a long lip of scleral tissue. A good-sized bite of this lip of sclera is removed either with the Lagrange punch or with special curved scissors. Sometimes two bites are made with the punch.

Then the iris is grasped with the forceps near the pupillary margin and drawn out until the sphincter is well outside of the wound, when a cut is made in the iris extending nearly up to the base on each side of the forceps. The portion that is within the grasp of the forceps is smoothed out with the black side uppermost, and the rest of the iris is carefully returned to the anterior chamber, leaving a long, narrow coloboma.

It is essential that the tongue of iris which is lying flat on the sclera should be smoothed out, but great care must be used not to rub off any of the black pigment layer. This leaves the black pigmented layer of the iris to come next to the replaced conjunctiva.

The conjunctiva is held in place by a running suture, the so-called water tight suture. Some atropin ointment is introduced and the lids are closed. A double dressing is then applied. The following morning the dressing is removed and a drop of atropin put into the eye to make sure the iris will not become bound to the anterior capsule of the lens, and the second morning this atropin is repeated if the pupil is not well dilated.

82 Commonwealth building.

IGNIPUNCTURE IN DETACHMENT OF THE RETINA

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The author describes Gonin's technique for first localizing the tear in the detached retina and then trephining the sclera and introducing a fine cautery point in the region of the retinal tear. Less optimistic than Gonin as to the results obtainable, the writer advises doing the operation in the majority of cases of retinal detachment (other than those occurring during pregnancy), in the belief that greater chances of success are offered by this than by any other method of treatment. Read before the Chicago Ophthalmological Society, December 16, 1929.

At the forty-fifth meeting of the German Ophthalmological Society, in Heidelberg in 1925, Gonin reported five cases of detachment of the retina, healed by ignipuncture, and explained briefly his operative technique.

Curiously enough, this communication aroused but little interest and escaped general notice. Before the same society in 1928 he reported twenty-six cases, reattached by the same operative technique. At the same time, he reiterated the statement that all detachments followed the occurrence of a tear in the retina, and that he believed the two conditions to occupy the relationship of cause and effect.

This time the inoculation took, and it set international ophthalmology agog so that Lausanne became the Mecca of ophthalmic pilgrims. The green turbans of those who had made the pilgrimage flourished at the International Congress held in Amsterdam last September, and "ignipuncture" became the cry of ophthalmic crusaders. But now, away from the magnetic personality of Gonin, it may be wise to consider the matter dispassionately from the standpoint of etiology, localization of the retinal tear, technique of operation, and end results.

Up to now, detachment of the retina has been considered as due to myopia, trauma, pregnancy, or unknown causes (cryptogenic), the last category covering the majority of cases and a multitude of diagnostic errors. Tears or holes or rents in the retina have long been known and have been described very fully, both early and late in the course of a detachment; and of recent years they have been considered as due to a lytic action by the accumulated subretinal fluid.

But now comes Gonin claiming that the retinal rent precedes the detachment, and that in reality the ablation of the retina is due to the entrance of vitreous into the subretinal space through the hole. The hole, he claims, is caused by the trauma which tears the retina near the ora serrata, or by the myopic stretching of the retina, causing one of the Blessig vacuoles to give way. The somewhat fluid vitreous then enters through the hole and spreads out between the retina and choroid, the process being facilitated by the fact that the retina merely lies against the choroid and is held there mechanically only and not by any tissue bonds. Thus the rent becomes the prime factor and not merely a secondary manifestation. To support this contention, Gonin claims that a rent may be found in every case if searched for long enough. If not found at the first examination, the search must be continued on subsequent days.

Attractive as this theory sounds, it does not and cannot account for the detachments of pregnancy, in which most frequently rents can never be found, and which furthermore are very prone to reattach without the benefit of medical aid. Nor does it account for the shape of the rents, which are almost invariably either regularly oval or else horseshoe-shaped; whereas a forcible tear in tissue as tender as the retina, and as firmly fixed as it is at the ora serrata, is either diamond-shaped or irregularly jagged.

True enough, the edges of the tear always turn outward, showing that

there is an outward flow of vitreous, but the shape of the rent indicates a solution of continuity due to weakening of the structure itself rather than a forcible tearing apart. However, this point will remain in dispute until a large number of early cases of detachment have been examined with particular attention to the existence of a rent, even in the extreme periphery.

Is it not much more feasible to assume that preceding the appearance of the detachment there has been an area of exudative choroiditis with a serous exudate on the membrana basilaris. It may be supposed that this exudate lifts the retina slightly and interferes with the nourishment of the outer layers. As a result, there develop the toxins of stasis, which are known to have a lytic effect upon tissue, and as a result of the lysis there appears a minute rent or hole in the retina. Through this the vitreous pours in, enlarging the tear as it flows. It then spreads out between the retina and the choroid, and the clinical picture of retinal detachment is complete.

With this explanation, the retinal rent would have to be regarded as the result and not the cause of the detachment, but nevertheless it would play an integral rôle in the development of the disease. To account for the results obtained by ignipuncture, the spotlight of attention must be focussed upon the retinal rent. Consequently, it is more of academic than of clinical interest to argue whether "the chicken preceded the egg" or in more literal terms whether the rent preceded the detachment; for certain it is that a rent must be seen and localized before an ignipuncture may be attempted.

In ignipuncture, the localization of the rent is the most difficult procedure. The method adopted by Gonin is probably the most satisfactory of all and it is simpler than the many modifications offered. He uses the indirect method of ophthalmoscopy and, upon locating the rent, procedes to dot at the limbus, with India ink or methylene blue, the corneal axis that corresponds with the retinal axis along which the tear is located. At 180 degrees from this primary localizing dot, a similar location mark is made at the limbus. He then estimates the number of disc diameters that the rent is located behind the ora serrata or, if the rent is very posterior, the number of disc diameters anterior to the macula. He assumes that the ora serrata is 8 mm. behind the limbus and that the diameter of the disc is 1.5 mm. and he thus calculates the number of millimeters behind the limbus that the puncture is to be made. Mathematically, the method is very haphazard, but clinically it is as good as any, particularly if controlled with the ophthalmoscope at the time of operation.

The operation is performed under local anesthesia and with a widely dilated pupil. A fairly large opening is made in the conjunctiva, exposing approximately the area that is to be incised. Then a thread is stretched across the cornea, connecting the two localization dots, and is extended over the denuded sclera. Thus the axis of the rent is determined. Then with a steel measuring tape (sterilized), the distance from the limbus, previously determined ophthalmoscopically, is measured, and a dot of methylene blue is put on the sclera at the point indicated by the two localizing measurements. As mentioned previously, this spot cannot be determined mathematically, but is located by rough clinical estimations. The sclera is then incised with an ordinary Graefe knife which is turned in the aperture to allow of the escape of the subretinal fluid. As soon as free drainage ceases, the tip of a Paquelin cautery, glowing to red heat, is introduced through the puncture wound and inserted approximately two to three millimeters. It is allowed to remain in position for two or three seconds and is then rapidly withdrawn. The conjunctiva is closed with a suture, atropine is instilled, and the eye is bandaged. The patient should remain quietly in bed for the succeeding four to ten days, and the eye should be dressed and atropinized daily.

Gonin states that results cannot be

expected if the retinal rent is not included in the cautery scar, but Wessely has reported a successful result from more or less blind cauterization in a case where no rent could be found. If the rent edges are touched by the cautery, there results a rounded or oval white atrophic area, surrounded by heaped black pigment. To this area are bound down the edges of the retinal rent, and thus the retina is prevented mechanically from becoming detached again, at least in the immediate neighborhood.

But there is something more to it than that, and just what the something more is has not yet been explained. For example, I saw one case upon which Elschnig had performed an ignipuncture some six months previously with a perfect result, both anatomically and functionally; while, in contrast to that, a case with a clinically similar detachment which I sent to Gonin himself for operation was a complete failure, both anatomically and functionally, despite two ignipunctures, both of which struck the retinal rents centrically. Of course, if there is more than one rent present, it is reasonable to assume that one ignipuncture will not cause complete reattachment and that as many operations will have to be performed as there are retinal rents.

I have performed the operation five times upon three patients. The first case was one of bilateral detachment that had been present for many months, and consequently only an anatomical result could be expected. But that was obtained, complicated, however, by dense vitreous opacities that appeared after the operation.

In the second case, the detachment had been present for nearly two months and two retinal rents could be seen. Two ignipunctures were performed, and in each case the edges of the rent were included in the cauterization scar. But the detachment progressed and became as complete as though the very last word in surgical procedures had not been tried.

In the third case, the detachment was only ten days old and a rent could be seen in the extreme periphery. An ignipuncture was performed and luckily the cauterization was accurately localized. There followed a reattachment in the sector in which the operation was done, but the lower part of the retina remained detached and the detachment increased rapidly, despite bed rest. Ten days later another ignipuncture was done, after localization of another rent. This time the area was not struck so accurately and, although the retina became adherent to the sclera at the site of the cauterization, the rent remained open. This operation was followed by the appearance of rather dense vitreous floaters, and now, about six weeks later, the detachment is floating about as merrily as though it had never been disturbed.

After this brief recital of my own clinical experiences, I must confess that I am not so optimistic as Gonin, but of course this operation is not my child. However, the results reported by Gonin, Vogt, Igersheimer, Hanssen, Wessely, and others must be given serious consideration, for within the space of one year there have been more reliable reports of cures of retinal detachment than all other methods have accomplished in more than ten years.

So I, for one, propose to continue doing the Gonin operation in the majority of cases of retinal detachment (other than those occurring during pregnancy) in the belief that greater chances of success are offered by this than any other method of treatment or operation.

Gonin has now come to the conclusion that the operation offers the greatest hope for cure if performed between the tenth and the twenty-first day after the appearance of the detachment, while even older cases, if not too degenerated, still present some chance for success. But he insists upon accurate localization of the rent, and maintains that for complete success the edges of the rent must be included in the scar produced by the cauterization.

58 East Washington street.

PERIDECTOMY

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Peridectomy is used by the author for all forms of intractable vascular keratitis, excising a strip of conjunctiva 2 to 5 mm. wide around the whole corneal circumference, and also scarifying the vessels on the cornea with a sharp Beer's knife.

In searching after rare and unusual modes of therapy to combat the various pathological conditions that present themselves to our notice, we are very frequently prone to neglect some of the procedures that have stood the test of time. In this class may be placed the simple surgical treatments applied to the conjunctiva immediately surrounding the cornea, namely, peritomy (simple incision of the conjunctiva) and peridectomy (excision of a strip of conjunctiva for the full circumference of the cornea).

Despite our tremendous advances in the therapy of ocular conditions we still encounter vascular conditions of the cornea that are extremely resistant to treatment. The cornea in health is not the site of blood vessels visible to the naked eye, although with the slit-lamp empty blood vessels may be demonstrated in corneas which have recovered from inflammatory conditions. Whether greater magnification than is now available may show the presence of blood circulation is a matter for discussion, but from a practical standpoint it may be assumed that there are no blood vessels in the healthy normal cornea.

The fact that vessels develop in the cornea in the presence of inflammation in the conjunctiva of the lids, as well as in the cornea itself, accounts for the consideration of these conditions as very closely allied. Most of our vascular corneal conditions are to be found in connection with trachoma or even with less specific inflammations of the conjunctiva attended with granular excrescences. The local irritation is so great in these cases that it is justifiable to attribute the vascularity of the cornea that attends them to the effort of nature to maintain the integrity of the cornea by the creation of a new blood supply to relieve the lymphatic system of the terrific drain upon it. The infiltration of the cornea, its cloudiness, its sensitiveness to light, and other manifestations point to the great alterations in its normal physiology. The slit-lamp affords us considerable evidence of the tremendous changes taking place in the cornea which is developing a new source of nourishment in this new blood supply.

Our task is to determine when this new development has passed from the stage of a beneficent activity to that of an essential pathologic problem. The duration of the condition is of more value in the determination of this point than is the virulence of the reaction. In the earlier stages the vascularity is confined to the outer layers of the cornea, but with a long-continued affection the deeper layers become involved. There are also cases in which individual ulceration becomes nourished by a leash of vessels extending from the periphery of the cornea. All of these conditions give the attending surgeon considerable concern. He is fully aware of the underlying affection, but even in the face of eternal vigilance and continued treatment the corneal condition arises and progresses.

As long ago as 1842, Furnari of Paris devised the procedure which we call peridectomy, that is the excision of a strip of conjunctiva surrounding the periphery of the cornea. The military type of trachoma was at this time very widespread throughout Europe and Northern Africa, and Furnari was called upon to treat many cases in Algiers among the natives. Being busy with his work, it was not until 1862 that he published his experiences with the operation. It is all within the range

of possibility that this may have been a routine procedure with the surgeons of his time and perhaps for a long while before his day. When a widespread epidemic of any disease prevails we are likely to find men doing the same thing independent of one other, each believing some special procedure he employs to have had its origin in his service. However that may be in connection with this operation, our only recorded evidence gives Furnari credit for its introduction.

As performed by Furnari, the technique was somewhat as follows: An incision was first made at the outer canthus, after which a broad ring of bulbar conjunctiva was excised extending from the margin of the cornea to within three millimeters of the line where the conjunctiva is reflected from the globe to the inner surface of the lid. A flap of conjunctiva at the margin of the cornea was allowed to remain until last, in order to fix and rotate the eye at the will of the surgeon during the operation. The subconjunctival tissue was then carefully dissected away so as to expose the sclera. The vessels of the cornea were then scarified, after which the sclera and the ulcerated portions of the cornea were touched with silver nitrate. It may be readily appreciated that this operation was rather formidable and admitted of considerable variation in the hands of fellow surgeons who hesitated to be quite so radical. Also the performance of this excision in the absence of the repose now possible with complete desensitizing of the cornea made for many complications.

Our unsatisfactory experience with peritomy, which was evolved from this operation by more conservative surgeons, has led us to approach closer to the original operation in our practical application of the procedure, and our results have been most gratifying.

While from a purely theoretical standpoint an incision of the conjunctiva encircling the cornea should accomplish wonders in impeding the blood supply to those areas pathologically vascularized, the objective is defeated in actual practice by prompt union of the cut edges. Naturally, therefore, this procedure has fallen by the wayside. Unfortunately the good that could come from the excision of a strip of the conjunctiva in this same situation has been ignored in the zeal to condemn its less radical substitute.

In our practice we utilize peridectomy, as it should be designated, for all forms of intractable vascular keratitis. The site of the excised area becomes filled in with a kind of connective tissue which unites the conjunctiva closely to the globe, completely sealing up that area. A second peridectomy on this same site is impossible.

The operation may be readily performed under the anesthesia produced by instillation of one or two drops of a five per cent solution of cocain. If excessive hemorrhage is anticipated a drop or two of adrenalin chloride solution (1 to 1000) may also be instilled. A strip of conjunctiva about two to five millimeters is then excised with scissors all around the periphery of the cornea. In addition the vessels in and on the cornea are scarified with a sharp Beer's knife. Noviform ointment (one per cent) is applied, followed by a light dressing.

The results of this operation are such as no other procedure could procure, and our recommendation is therefore very enthusiastic.

303 South Seventeenth street.

RETINAL ANGIOSPASM: ITS RELATION TO ARTERIOLAR DISEASE

Report of fifty-three cases

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From a large mass of clinical material, including general and laboratory examinations, the author concludes that benign hypertension and malignant arteriosclerosis belong to the same category, differing only in severity; that arteriosclerosis in young persons is always secondary, while senile arteriosclerosis is primary; that angiospasm is the initial factor in arteriolar disease; and that in the absence of changes in the fundus arteriolar disease can not exist. From the medical and neurological service of Montefiore Hospital. Read before the Clinical Society of Sydenham Hospital, February, 1929, and the Medical Society of New York University, November, 1929.

The diagnosis of arteriosclerosis and hypertension covers a multitude of cases which in the light of our study of the fundus oculi cannot be placed in the same category.

Some years ago, in my work on large medical services, I became interested in fundus pictures in relation to hypertension and renal disease[1]. Imbued with the common belief that changes in retinal arteries may or may not exist in cardiorenal and vascular diseases, I began to study clinically cases with apparently normal fundi. Ultimately, I found that with variation in the fundus picture there was a variation in the clinical picture. I also found that some apparently normal fundi showed some fine changes which were easily overlooked.

My earliest conception of hypertension came from Dr. Francis Delafield,[2] who spoke of contraction of the peripheral arteries as a definite cause. He made no distinction between the spasms of large arteries and those of small arterioles. He described very clearly the pathological appearance of glomeruli in chronic interstitial nephritis. These showed sclerotic arterioles with obliteration of some branches and perivascular connective tissue changes. He believed that in cases of contracted kidney arterial disease was antecedent to renal disease.

Moore[3] made a distinction between renal and arteriosclerotic retinitis. He intimated that the latter was a definite localized vascular disease affecting the retinal artery. In a study of forty-seven cases of arteriosclerosis he found fundus changes in seventy percent.

Wagener[4] points out that in retinal arteriosclerosis with only a few hemorrhages renal function is only exceptionally lowered.

O'Hare and Walker[5] made an analysis of fifty cases of various ages with peripheral arteriosclerosis and systolic blood pressure less than 145 mm. mercury, and of a second similar group with systolic blood pressure of more than 145 mm. In the nonhypertensive group, average age 55.6 years, fifty-four percent showed no retinal changes. In the hypertensive group, average age 52.6 years, retinal arteriosclerosis was marked in sixty-eight percent.

Bridgett[6] reports cases of arteriosclerosis of the retinal arteries with negative postmortem findings in the aorta and in the coronary and cerebral arteries. Barré and Duverger[7] report a case of spasm of the retinal artery resembling embolism, in a patient with aortic stenosis. The vessels appeared threadlike but later resumed their normal caliber. Slight contraction of the visual field resulted, without change in the normal ophthalmoscopic appearance.

The present writer[8] reported similar attacks in two young patients (twenty-one and twenty-five years of age) with mitral stenosis. These patients were seen during the attack of spasm lasting two minutes, and the refilling of the artery was seen with the ophthalmoscope.

The subjective symptom was transient blindness. No arteriosclerosis or hypertension was found in either case.

McCoy[9] reports what he calls spasm of the central retinal artery in a woman of seventy-two years. The duration of the spasm was forty-five minutes. There was marked narrowing and beading of the artery. Treatment by massage and amyl nitrite restored the circulation and the fundus appeared nearly normal one week after the original observation. Vision remained 20/200.

Cohen[10] states that he found sclerotic changes in the retinal arteries post mortem, although the ophthalmoscope did not disclose any apparent abnormality. (This might correspond to cases of angiospasm.) He also states that choroidal sclerosis is not necessarily associated with retinal sclerosis. This coincides with my own clinical findings[8].

In more recent study my conception of hypertension was influenced by my belief that blood pressure elevation was caused by spasms of the arterioles of the visceral organs and brain and not of peripheral arteries. I also decided that biologically retinal arteries and arterioles of the organs were the same; that early changes in the retinal arteries were visible because normal retinal arterial walls were transparent; and that isolated spasms could cause localized vascular insults, with secondary sclerosis. Since my last publication[8] other observers[11, 12] seem to follow a similar trend of reasoning.

Judging from the variety of pictures seen in the fundus, I would classify arteriosclerosis as follows:

(1) senile atheroma
(2) atheroma of diabetes
(3) atheroma of syphilis
(4) thromboangiitis obliterans
(5) senile arteriolar sclerosis
(6) arteriolar angiospasm (essential hypertension)
(7) arteriolar disease (malignant hypertension)

(1) Senile atheroma is recognized by the cordlike peripheral arteries. There is no elevation in blood pressure and no change in blood chemistry. The fundi are generally normal but may show sclerosis of the choroidal vessels. I have also seen retinitis circinata, which consists of exudates surrounding the macula. The circinate arrangement is quite removed from the macula and may even be found in the peripheral region of the retina. The retinal arteries show only slight sclerosis.

(2) The atheroma of diabetes generally affects the peripheral arteries, but may affect the large trunks of the coronary. The fundi may be normal, or may show diabetic retinitis. The retinal arteries are normal. Retinal arteriosclerosis may be present but seems not dependent on diabetes.

(3) and (4). The atheroma of syphilis and thromboangiitis obliterans show no characteristic changes in the fundi.

(5) In senile arteriolar sclerosis the retinal arteries show a gradually increasing reflex and attenuation with slight unevenness in caliber. The color of the arteries is slightly paler than normal, with a silver wire line on top. Angiospasm and regular arteriolar disease may or may not develop. The elevation of blood pressure is in proportion to the degree of progress, and is very high only when angiospasm develops. The average blood pressure in senile arteriolar sclerosis is 160 to 180 mm. systolic with 90 to 100 mm. diastolic. Thromboses of retinal arteries or veins and cerebral thromboses are not infrequent. Post mortem there is found a subendothelial proliferation of connective tissue.

(6) Angiospasm of arterioles (essential hypertension) seems to be the precursor of arteriolar disease. There is a marked intermittent or remittent elevation of blood pressure. The retinal arteries are normal but show what is going on in arterioles in other organs. Spasm of some branches of the central arteries is evidenced by hour-glass contraction, generally near the disc. The artery seems normal in size and color at the outset; then shows a narrowing and paling for a varying distance; then

continuing goes back to normal color and caliber.

This narrowing or complete closure may be transient, with return to normal caliber. Permanent changes, however, may result, when the spasm is too persistent. These are evidenced by constrictions. Indentation of veins as the arteries pass over them varies with blood pressure, proving that it is caused by high blood pressure and not by sclerosis. The contrast between the definitely spastic and the normal branches is striking and should not be overlooked. Slight spasms may be overlooked.

In complete spasm the retinal artery disappears from view and blindness results. If the spasm is only of short duration, two to three minutes, vision returns. Prolonged spasm results in permanent blindness, the course stimulating embolism or thrombosis. After a prolonged spasm the retinal artery may show a slight tendency to reopening and may return to view. Such late reopening is not accompanied by return of vision. The retinal arteries remain narrow and threadlike and develop secondary sclerosis, evidenced by copper-wire appearance and perivasculitis. The optic disc develops simple atrophy. The appearance of hemorrhages and exudates in these cases is secondary to angiospasm, which probably results in thromboses of the venules caused by stasis.

It seems self-evident that the arterio lar spasm is the initial factor, and that depending on the multiplicity of the spasms as well as on their duration a picture of the disease of varying severity becomes manifest.

Essential hypertension and arteriolar disease (malignant hypertension) are in the same category, the difference being one of degree. Symptoms referable to the brain and other organs, particularly the kidneys, are dependent on arteriolar spasms of varying duration and severity.

If we could find the cause of angiospasm we could solve the great problem of this terrible disease, which is responsible for the curtailment of so many lives. Is it toxemia, central nervous system, sympathetic nervous system, or internal secretions? If we can prevent essential hypertension we can control the worst type of arteriolar disease.

In my opinion, judging from the behavior of the retinal arteries, all cases of arteriolar disease are secondary to angiospasm. Localized arteriosclerosis is easily explained by the localization of angiospasm.

The only primary arteriosclerosis is senile sclerosis, which may involve only the large arterial trunks or the arterioles as well. Only in the later form does hypertension develop. In scrutinizing the literature we cannot put too much faith in fundus interpretations which were not the results of special study of retinal arteries.

Conclusions

(1) Angiospasm is not only a prodromal sign but the initial factor in the development of arteriolar disease.

(2) Benign hypertension and malignant arteriosclerosis belong to the same category, differing in severity.

(3) Arteriosclerosis in young patients is always secondary.

(4) Senile sclerosis is primary.

(5) Only upon removal of the cause of angiospasm can arteriolar disease be controlled.

(6) Changes in the fundus are in proportion to the development of the disease.

(7) In the absence of changes in the fundus arteriolar disease cannot exist.

(I wish to thank Dr. Joseph J. Michaels of Detroit for his able assistance in compiling my case records.)

Case reports

(NOTE BY EDITOR: Dr. Agatston's paper was accompanied by condensed records of fifty-three cases, presenting details analogous to those included in the fifteen here reproduced. To economize space the remaining thirty-eight case records are omitted, although the author's conclusions are of course based upon the whole series.)

Case 1. Y.G., aged 63, female. Med. diag., hypertension and cardiac hypertrophy; nephrosclerosis; hypertrophic arthritis right hand. Mastectomy. B.p. 218/105. Blood chem., sug. 106, urea 11.3. Urine: alb. trace, sug. 0, occasional hyaline and granular casts. Fundus findings: angiospasm and secondary sclerosis of some of the vessels. Fundus diag., arteriolar disease.

Case 2. R.W., aged 68, female. Med. diag., hypertension, gen. arteriosclerosis, cardiac hypertrophy and dilatation, paroxysmal pulmonary edema. B.p. 200/90. Blood chem., sug. 111-131, urea 30.1. Urine: alb. 4 plus, sug. 0, few w.b.c. and casts. Fundus findings: hemorrhages, exudates. Some angiospasms, slight sclerosis of vessels. Fundus diag., moderate arteriolar disease.

Case 3. B.H., aged 70, male. Med. diag., cerebral arteriosclerosis, multiple cerebral hemorrhages. B.p. 156/90. Blood chem., surg. 140, urea 21.1. Urine: alb. 0, sug. 0. Fundus findings: retinal arteries show slight increase in reflex, some branches hypertrophic with pressure on veins. Fundus diag., senile sclerosis. Remarks: cerebral condition probably caused by venous thromboses.

Case 4. J.H., aged 60, female. Med. diag., cerebral arteriosclerosis, thrombosis of right lenticulostriate artery, hypertension. B.p. 212/96. Blood chem., sug. 142, urea 11.1. Urine: alb. 0, sug. 0. Fundus findings: posterior polar cataract, moderate angiospasm with secondary arteriosclerosis in a few branches. Fundus diag., essential hypertension.

Case 5. L.M., aged 51, male. Med. diag., hypertension and angina pectoris; adenoma of thyroid. B.p. 170/90, 220/118. Blood chem., sug. 103, urea 12.3. Urine, alb. 0, sug. 0. Fundus findings: discs show hyperemia, arteries show tendency to spasm as evidenced by unevenness in color and caliber. Fundus diag., essential hypertension.

Case 6. D.G., aged 67, male. Med. diag., hemorrhage left lent.-striate artery. B.p. 130/84. Blood chem., not done. Urine, alb. 0, sug. 0. Fundus findings: definite angiospasm, arteriosclerosis with irregular caliber. Fundus diag., senile sclerosis with angiospasm.

Case 7. L.G., age 60, female. Med. diag., gen. arteriosclerosis 1/1/29; hypertension; diab. mell., Feb. 5, 1929; multiple cerebral vascular lesions. B.p. 172/96, 140/70. Blood chem., sug. 196, urea 20.0. Urine, alb. 0, sug. 0. Fundus findings: Right, angiospasm; Left, angiospasm and moderate sclerosis. Fundus diag., essential hypertension.

Case 8. S.R., aged 61, female. Med. diag., gen. arteriosclerosis 12/24/28, coronary sclerosis, hypertension, auric. fibrillation, cirrhosis of liver. B.p. 155/88. Blood chem., sug. 120, urea 3.5. Urine, alb. 0, sug. 0. Fundus findings: R. copper wire arteries of good caliber, hour glass contraction in spots, large vitreous opacity. L. some evidence of angiospasm, very little sclerosis, some branches of retinal arteries show copper wire appearance. Fundus diag., essential hypertension, incipient arteriolar disease. Autopsy: cirrhosis of liver, splenomegaly, gen. arteriosclerosis, arteriosclerosis of kidneys, arteriosclerosis of coronary art., chronic passive congestion.

Case 9. L.B., aged 61, male. Med. diag., generalized and cerebral arteriosclerosis. B.p. 150/84, 136/76. Blood chem., sug. 101, urea 15.7. Urine, alb. 0, sug. 0. Fundus findings: R. angiospasm, moderate sclerosis marked by arteries of uneven caliber and color. L. angiospasm of retinal vessel, sclerosis less marked. Fundus diag., senile sclerosis with angiospasm.

Case 10. L.G., aged 62, male. Med. diag., amputation right leg and thigh; previous amputation left leg; resection of rectum for carcinoma; arteriosclerotic gangrene left leg; bronchopneumonia. B.p. 265/120. Blood chem., Feb. 10, 1928, sug. 130, urea 20.7. Urine, alb. 0, sug. 0. Fundus findings, angiospasm both fundi, with definite spastic narrowing of several branches of retinal arteries. Fundus diag., essential hypertension. Autopsy: gen. arteriosclerosis, arteriosclerosis of kidneys, bronchopneumonia, amputation both lower ex-

tremities. Microscopic: kidney small cortical scars, vessels show marked uniform fibrous thickening.

Case 11. E.B., aged 51, male. Med. diag., coronary sclerosis and thrombosis, cardiac hypertrophy and dilatation, auricular fibrillation, anasarca. B.p. 126/92. Blood chem., sug. 144, urea 17.7. Urine, alb. trace, sug. 0. Fundus findings: angiospasm of retinal vessels, no sclerosis. Fundus diag., essential hypertension.

Case 12. R.O., aged 6½, male. Med. diag., chronic glom. nephritis, hypertensive encephalopathy, hypertension. B.p., L. 168/128, 164/128; R. 178/128; 172/128. Blood chem., Dec. 7, 1928, sug. 68, urea 29; Dec. 14, urea 19.3; Dec. 19, urea 17.1, sug. 90. Urine: alb. trace, sug. 0. Occasional gran. cast. Fundus findings: arterial spasm very marked, with secondary neuroretinitis of arterial origin; no evidence of intracranial pressure. Fundus diag., arteriolar disease. Remarks: convulsions and headache. Question of tumor in post. fossa entertained at one time.

Case 13. C.H.F., aged 51, male. Med. diag., frontal brain tumor, cerebral arteriosclerosis. B.p. 180/110. Blood chem., sug. 114, urea 19.4. Urine, alb. 0, sug. 0. Fundus findings: arteries of good size, normal in color, show tendency to spasm. Fundus diag., essential hypertension. Remarks: oculogyric movements, dizziness, headaches. Question of tumor or arteriosclerosis. Post mortem showed numerous areas of softening.

Case 14. S.W., aged 28, female. Med. diag., chronic nephritis, hypertension, syphilis. B.p. Dec. 5, 1928, 154/108; Jan. 7, 1929, 130/104. Blood Chem., Nov. 12, 1928, urea 22.2, sug. 101; Dec. 26, 1928, urea 20.4, sug. 95; Mar. 4, 1929, urea 32.8; Mar. 13, 1929, urea 53.7. Urine, Nov. 22, 1928, alb. 2 plus, sug. 0, hyaline and gran. casts; Mar. 6, 1929, alb. 3 plus, sug. 0, hyaline and gran. casts and white blood cells. Fundus findings: definite spasm of arterioles; hour glass contraction of left. lower temporal branch; Right, small hemorrhages due to toxemia, several small arterioles are blocked and replaced by strands of connective tissue, arteriosclerosis in first stage of development. Fundus diag., angiospasm with secondary sclerosis. Remarks: history of unconsciousness; residua of multiple vascular lesions, almost pseudobulbar in appearance.

Case 15. J.B., aged 48, female. Med. diag., mitral stenosis and insuff., aortic insuff., cardiac hypertrophy and dilatation, residual right hemiplegia. B.p. 180/100. Blood chem., sug. 100, urea 21.4. Urine, alb. 0. sug. 0. Fundus findings: Ret hemorrhages, spasms of vessels. Fundus diag., essential hypertension, Remarks: residual right hemiplegia and aphasia, question of embolus to left cerebrum.

2 West Eighty-seventh street.

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SCLERAL CYST OF TRAUMATIC ORIGIN

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LOS ANGELES

The eye had been penetrated by a piece of wood a year and a half earlier. The cystic mass extended from the limbus toward the outer canthus. The outer wall of the cyst was excised, and the posterior wall lightly swabbed with trichloracetic acid and then covered with a conjunctival flap. Microscopically the anterior wall of the cyst presented a lining epithelium and a rather thick layer of scleral fibers.

True scleral cyst of traumatic origin and without involvement of some portion of the uveal tract in its makeup is rare. In this discussion only the above type of cyst will be considered.

In 1853 Lawrence[1] reported two instances of scleral cyst in his textbook. In the first the cyst was located at the limbus and contained clear fluid on puncture. After removal of the anterior wall there was prompt healing. In the second patient there was iris inclusion and the eye was lost.

In 1887 De Vincentiis[2] reported a cyst of the sclera which arose as a result of a burn. It was extirpated and found to be lined with pavement epithelium. In 1901 Gruening[3] described a cyst extending from the cornea into the sclera in a twelve-year-old girl who had had an iridectomy performed two years previously. There was no communication between the cyst and the anterior chamber, as the chamber remained full when the cyst was evacuated. The cyst refilled and enucleation was done. The cyst wall was lined with endothelium.

In 1904 Hans Lauber[4] reported two cases of scleral cyst. In the first there was a history of a perforating wound at the limbus by a splinter of wood. There was iris prolapse. Two years later, at the site of injury appeared a cyst over which the conjunctiva was movable. The anterior wall was removed and a small hole communicating with the anterior chamber was found and cauterized. The lining of the cyst was corneo-conjunctival epithelium containing some beaker cells. The second patient had received a knife wound when three years of age. A cyst had been growing for ten years when the globe was enucleated because of pain. The lining was stratified squamous epithelium.

Früchte and Schürenberg[5] in 1906 had a sixteen-year-old patient who had received a perforating wound with a fork at the age of ten years. A cyst appeared two years after injury. The cyst contained two cavities, was lined with stratified epithelium, the anterior wall was composed of sclera and cornea, and the posterior wall consisted of cornea and iris. In 1907 Ischreyt[6] cited a case in which an enucleation was done because of sympathetic ophthalmia six years after a perforating wound. There was a scleral cyst lined with corneal epithelium. He also found an iris cyst in this eye.

In 1921 Goulden and Whiting[7] reported a scleral cyst developing after a strabismus operation. No foreign material could be found and the lining was of conjunctival epithelium. In 1923 Filatoff[8] described an eye upon which two iridectomies, a lens extraction, and an Elliot trephine operation had been done. Six months after the trephine operation an intrascleral cyst appeared at the site of operation. This was incised twice without cure but was finally successfully treated by removing a part of the anterior wall and covering the exposed ciliary body with conjunctiva.

In 1925 Velhagen[9] reported a case in

an eleven-year-old child who had a perforating wound of the limbus due to a stick. There was iris prolapse which was excised and covered by a conjunctival flap. Six months later a kidney-shaped tumor 2.5 by 4.5 mm. was present at the site of the injury. The conjunctiva was movable over it and it could not be emptied by pressure. The anterior wall of the cyst was removed and the posterior wall curetted and covered with a conjunctival flap. The anterior wall showed a layer of stratified epithelium one to four cells deep with no beaker cells or glands, a layer of scleral tissue, a layer of organized granulation tissue, a layer of the substantia propria of the conjunctiva, and a layer of conjunctival and corneal epithelium. The inner and outer layers were quite similar. There was no communication between the cyst and the anterior chamber.

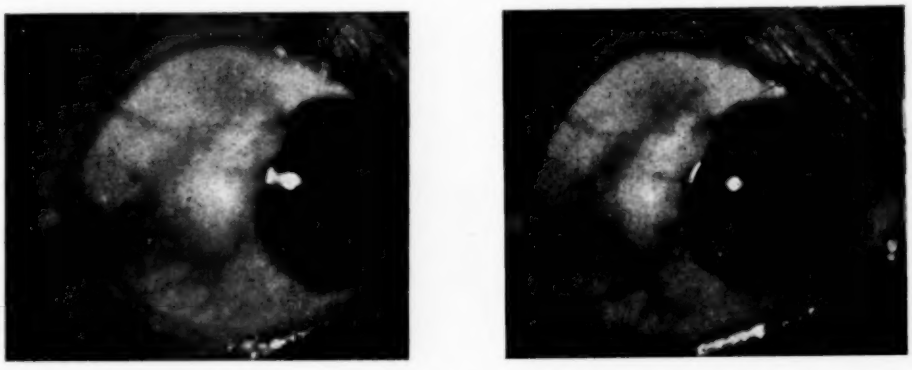

Fig. 1 (Weymann). Stereophotograph of eye showing cyst.

Abramowicz[10] in 1926 reported the case of a woman of twenty-four years who in childhood had wounded the right eye with a knife. A tumor extended from the caruncle to the cornea. It was kidney-shaped and was filled with clear fluid. Enucleation was done. A cyst was found, two-thirds of which was intrascleral and one-third intracorneal. The epithelial lining was of corneal nature and had grown into the anterior chamber through a communicating hole. There was no hypertension.

Case report: On September 19, 1927, a boy ten years of age consulted me with a history of having been struck in the right eye with a stick of wood two weeks before. The stick perforated the globe and was pulled out by him. The eye was inflamed for several days, and since the injury he had not been able to see.

Examination showed no light perception in the right eye, and a visual acuity of 20/15 in the left eye. The right pupil did not react to light. There was evidence of a recent wound in the conjunctiva and sclera just outside the limbus at the eleven o'clock position. The anterior chamber was formed and clear. With the ophthalmoscope the red reflex was absent, but a dark-red mass was visible behind the lens. The left eye appeared entirely normal.

A diagnosis of massive hemorrhage into the vitreous was made. An unfavorable prognosis as to recovery of vision in the right eye was given. The patient's mother did not bring him back for observation as requested, and he was not seen again until April 9, 1929, at which time there was a complaint of a growth having been present at the site of the injury for three or four months, with progressive increase in size. The right eye still showed no light perception and it diverged 20°.

A cystic mass extended from the limbus about 7 or 8 mm. toward the external canthus and about one-fifth the circumference of the cornea. It was raised 2 to 3 mm., and was tender to

palpation. Pigment seemed to shine through as if the sclera were thinned. The conjunctiva was movable over the tumor, and the slit-lamp showed it to be definitely a cyst. The tension was normal. The pupil did not react to light except consensually.

Behind the lens could be seen an organized irregular movable white mass in the vitreous, the position of which varied upon movement of the eye. The disc could not be seen because of this mass, but the peripheral retina showed marked atrophy.

The diagnosis of scleral cyst was made, and operation was undertaken on April 30. The conjunctiva was dissected back from the cyst except near the limbus, where it was adherent, and the anterior wall was incised. Clear fluid escaped, without collapse of the anterior chamber. As advised by Cords[11] the anterior wall of the cyst was then excised. It appeared to be composed of scleral tissue. The ciliary body could be seen shining through the thinned posterior wall. The surface of the posterior wall was lightly swabbed with trichloracetic acid and was covered with a conjunctival flap. Healing was uneventful, and at the present time, in November, 1929, there is no evidence of recurrence of the cyst or of ectasia of the sclera at its site.

Gross examination of the anterior wall of the cyst showed that this wall resembled scleral tissue. Upon section there were found lining epithelium, a rather thick layer of true scleral fibers, and an external layer of conjunctival epithelium. In some places the lining epithelium was absent and was replaced by necrotic tissue and débris. The lining epithelium resembled more the normal epithelium of the cornea than that of the bulbar conjunctiva. It was made up of flattened and cuboidal cells, one to four layers deep. The conjunctival epithelium on the external surface was very similar to the lining epithelium and also tended to resemble the epithelium of the cornea.

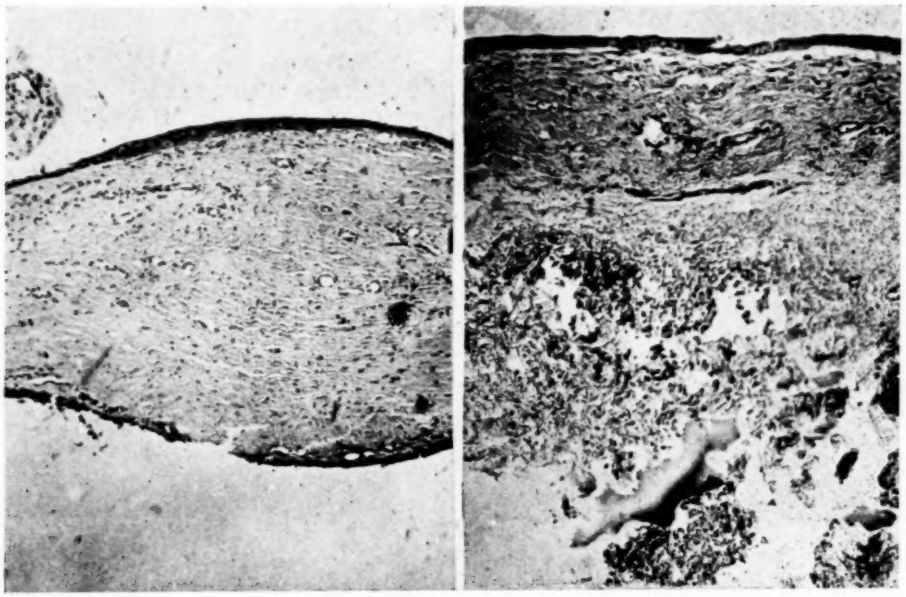

Fig. 2 (Weymann). Low power photomicrographs of anterior cyst wall, conjunctival surface toward top of page. On the left one sees a lining epithelium, on the right there is only necrotic tissue. Note thick layer of true scleral fibers

It seems possible that this alteration in the appearance of the conjunctival epithelium might be due to the increased pressure of the lid over the

region of the tumor, and, if we consider the origin of the lining epithelium to have been a conjunctival implant, we may account for its flattened appearance also through the action of pressure of the cyst contents. Embryologically the epithelium of the conjunctiva and that of the cornea have a common origin, and it is not unreasonable to assume that when conjunctival epithelium is subjected to pressure against a firm base it may come to resemble corneal epithelium. For this reason I think that it would be impossible to state whether the lining of a cyst were derived from a conjunctival or a corneal implant.

Upon survey of these reported cases it appears quite obvious that these cysts are implantation cysts, from either corneal or conjunctival epithelium. Lauber believed that in addition to the implant, the cystic development arose from the fact that the external wound healed and aqueous escaped through the internal wound into the cleft occupied by the implant, dissected between the easily split scleral fibers, and thus permitted a cyst to be formed.

This theory would imply that in all cases there must be communication with the anterior chamber during the early stages of cyst formation. In the case of the cyst reported by Goulding and Whiting following a strabismus operation, it is not likely that there was ever communication with the anterior chamber. The mere intralamellar implantation of a bit of conjunctival or corneal epithelium should be sufficient explanation for the development of a cyst, as the growth of this epithelium could of itself split the sclera.

Scleral cyst in itself thus seems to be a very slowly growing tumor, and it may be successfully dealt with by extirpation of its anterior wall, if the injury causing the cyst has not produced such further damage as to destroy the eye.

2007 Wilshire boulevard.

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A CASE OF EXTREME MEGALOCORNEA

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In an otherwise normal man, with fairly good visual acuity, the diameter of each cornea was sixteen millimeters. The condition was true corneal overgrowth and not buphthalmos.

In June, 1928, a man was sent to me to be examined because of the peculiar appearance of his eyes. The patient, J. H., was a young man twenty-eight years of age, strongly built and normal in every way except for his eyes, which looked like those of a marmoset. As the eyes were almost exactly alike the description of one applies to both.

The fundus was normal. There was no cupping of the optic disc. The tension was normal. R.V.=6/12; with cylinder —1.50 axis 180 degrees=6/9. L.V.=6/60; with sphere —1.50 and cylinder —2.00 axis 180 degrees=6/18.

This ocular condition has been present from birth. He has ten brothers and sisters. His father and two brothers have eyes which show the same peculiarity but not to the same degree. Fuchs states that the normal diameter of the cornea is 11.50 mm. in the horizontal and 11.00 mm. in the vertical diameter. Collins states that the average diameter of the cornea is 11.67 mm. I measured the cornea carefully with calipers in my case, and each cornea was found to be 16.00 mm. in diameter. The accompanying photographs give a good idea of the man's appearance.

Extreme megalocornea (Mathewson).

The cornea was very prominent and very large, so that only a narrow rim of sclera could be seen around it. The iris was also very large, and the anterior chamber was extraordinarily deep. The iris was quite flat and there was well marked iridodonesis. The lens was present in both eyes. The media showed no abnormality beyond a small superficial scar in the lower part of the right cornea and a short arcus senilis in the left cornea.

The relatively good vision, coupled

with the absence of deep scars of the cornea, the normal tension, and the lack of cupping of the optic disc, make it clear that we have true overgrowth of the eyeball and not buphthalmos to deal with.

202 New Birks building

AMBLYOPIA FROM INGESTION OF GELSEMIUM CONTAINED IN A NOSTRUM

EDWARD STIEREN, M.D., F.A.C.S.
PITTSBURGH

The patient had taken a patent remedy for sciatica, which analysis showed to contain a mixture of gelsemine and gelseminine. Vision and hearing were disturbed, but returned to normal within a week after withdrawal of the nostrum. Read before the Allegheny County Medical Society, December 17, 1929.

F.E.S., male, aged eighty-four years, had had his left eye operated upon for senile cataract nine years before, retaining continually corrected vision of 6/8. The right eye had a mature senile cataract.

He appeared January 23, 1928, stating that he had recently lost his vision and was becoming deaf.

Ophthalmoscopic examination revealed nothing abnormal in his media or fundus to account for his reduced vision, which was now 6/60. There was no ptosis of either lid, and movements of the globes in all directions were normal. Bone conduction was much lowered on both sides, and he could not hear ordinary conversation.

In questioning him, the only departure he had made from an ordinary routine life was the taking of a remedy for sciatica which had been recommended to him by a friend, and which was sold under the name of "Athlophoros." He had taken about three ounces over a period of four days, and about three ounces still remained in the bottle.

As his symptoms appeared to be those of quinine amblyopia with deafness, the remainder of the mixture was submitted to Professor Julius A. Koch, dean of the Pittsburgh College of Pharmacy, with the request that it be examined, particularly in regard to quinine content.

Dr. Koch's report is as follows:

"I found two reports on the composition of Athlophoros in the literature. One by Oleson in 1903 was as follows:

Potassium acetate	60 grains
Sodium salicylate	490 grains
Sugar	4 ounces
Caramel	3 drops
Water	14 fluid ounces

"The other, a government report, gave the composition as:

Glycerin	69.5 per cent
Sodium salicylate	11.8 per cent
Methyl salicylate	
Oil of peppermint	
Oil of cinnamon	
Alcohol	
An alkaloid (not colchicine)	
Licorice	

"Our examination of the specimen submitted seems to confirm the government analysis, as we found 11.6 per cent of sodium salicylate, and a small quantity of an alkaloid seemingly a mixture of gelsemine and gelseminine, dissolved in glycerin and water and flavored with volatile oils of peppermint, cinnamon, and birch."

As this patient had on a number of occasions taken as much as sixty grains of sodium salicylate daily over long periods without affecting either his sight or hearing, it seems logical to conclude that the mixture of gelsemine and gelseminine was the poisoning agent. His vision and hearing returned on withdrawal of the nostrum, and the use of saline catharsis daily for a week.

A search of the literature fails to reveal a similar account of disturbance of vision from the ingestion of gelsemium, with a single exception. Amyat, in the British Medical Journal of March 16, 1901, reports the case of a twenty-two year old female who purchased some "neuralgic mixture" from a chemist, taking one dose. About three-quarters of an hour later she complained of her head, and said that she could not count the pips on playing cards. When examined by the physician he found the pupils were slightly dilated and quite insensitive to light. There was no marked diplopia, but the sensation of giddiness and swimming of sight was extreme.

The "neuralgic mixture" contained ammonium bromide, ammoniated tincture of quinine, and tincture of gelsemium. The one dose taken contained ten minims of tincture of gelsemium.

According to Potter's "Materia medica", gelsemium contains two alkaloids, gelsemine which forms crystalline salts and is only slightly active, and gelseminine which is amorphous and highly toxic. In moderate doses it causes languor, slowing of the cardiac rate, enfeebled muscular action, impaired sensibility, drooped eyelids, and slightly dilated pupils. It is decidedly mydriatic when locally applied to the eye, acting probably by paralyzing the oculomotor terminals. It has been used with varying success in intercostal neuralgia, myalgia, sciatica, spasmodic asthma, sick headache, eczema, pruritus, and tetanus.

Ringer, in the American Encyclopedia of Ophthalmology, states that gelsemium when taken internally may cause miosis, although it is a mydriatic when locally applied. No description of the drug is given in the tenth revision of the United States Pharmacopeia. According to the National Dispensatory, gelsemium primarily depresses the sensory side of the spinal cord, but later if given in large amount depresses the motor side. The drug has no effect upon the spinal nerves, but the motor cranial nerves are paralyzed by large doses.

It would seem from this case that the nerves of special sense may likewise be affected.

626 Union Trust building.

HOW TO USE THE CROSS CYLINDER

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DENVER

Instructions as to learning the use of the cross cylinder, and as to its practical application for determining the correct strength and axis of the astigmatic lens required, are given in the form of questions and answers.

The cross cylinder is a lens having the effect of two cylindrical lenses, one convex the other concave, of equal strength, placed with their axes at right angles to each other. It is mounted in a ring, which has a small round handle, easily rotated between the thumb and finger. The handle is placed at an angle of 45° from the axes of the two cylinders; that is, just midway between the two axes. Rotation of the handle reverses the action of the cylinders, placing the convex axis in the direction previously held by the concave axis and vice versa. It is here attempted to answer some of the questions that are frequently asked about the cross cylinder.

How can I learn to use the cross cylinder?

Have someone who uses it demonstrate it, by testing your eyes with it. Or get a cross cylinder and test your own astigmatism (or the astigmatism produced by a one-diopter convex cylinder, placed before your eye). Generally start with the + 0.50 — 0.50 cylinder; but if the eye has standard vision, or better, you may start with the + 0.25 — 0.25 cylinder. Begin by holding the handle of the cylinder at 45° or 135°. This will bring the axes of the cylinders at 90° and 180°. Reverse the axes, by rolling the handle between the thumb and finger. If the two ways are equally bad, there may still be astigmatism with meridians near 45° and 135°. To test for this hold the cross cylinder handle at 180° or 90°, and again rotate. If the two ways are still equally bad, there is probably no regular astigmatism. If one position is better than the other, there is some regular astigmatism in the eye; and the axis of the correcting cylinder will be somewhere near the direction of the similar axis (axis of like sign, plus or minus) of the cross cylinder. For further testing put a cylinder in the trial frame with its axis in that direction.

How can I know if the axis of the cylinder in the trial frame is in the right direction?

Hold the cross cylinder before the eye with its handle in the direction of the axis of the cylinder in the trial frame. Rotate the cross cylinder, first one way then the other. This changes the action of the combined cylinders, and shifts the axis of the combination, first one way then the other. Shift the axis of the trial frame cylinder toward the similar axis of the cross cylinder when it makes the vision better (or, in other words, away from the direction of the similar axis that makes vision worse). When the point has been reached at which the cross cylinder makes vision just as bad one way as the other, the axis of the cylinder in the trial frame is correct.

How can I find if the cylinder in the trial frame is of the right strength?

Use the cross cylinder before the eye with its handle at 45° with the axis of the cylinder in the trial frame. One axis of the cross cylinder will be parallel, the other at right angles, to that of the trial frame cylinder. Rotate the cross cylinder. If one way is just as bad as the other, the cylinder in the trial frame is right for strength. If the vision is better when the similar axes are parallel, the cylinder in the trial frame needs to be made stronger. (Or in other words, if it is worse when similar axes are parallel, the cylinder in the trial frame should be made weaker.)

Must the patient have full vision to use the cross cylinder?

No. The cross cylinder can help greatly when the vision is very poor.

The worse the vision, the stronger should be the cross cylinder, so that the patient can be sure which way it makes his vision worse or better, or that it is just as bad one way or the other. As the vision gets better a weaker cylinder may be used, if the patient can answer as surely for the weaker cylinder as for the stronger one. For vision of 0.5 or better, the strengths mentioned above are right. For vision of less than this stronger cylinders may be used.

What cross cylinders are needed?

Those above mentioned. It is not necessary to have other strengths in your set. For the few cases in which stronger cylinders are wanted you can use those in your trial case. Hold a convex and a concave cylinder, with their axes at right angles to each other, before the patient's eye, and turn them to different meridians. This is not done so easily or quickly as the turning of the cross cylinder properly made and mounted. But it answers for the rare cases in which strong cylinders are needed. In addition to those first mentioned the writer has a + 1. — 1. cross cylinder. But this is rarely used. Plus and minus 3. and + and — 6. can be combined from the trial case. A cylinder like + 0.12 and — 0.12 is not generally useful; because very few people can certainly notice the difference it makes in vision when used for testing.

How often should the cross cylinder test be repeated?

For each eye, it should be repeated as to direction until the examiner is satisfied he knows exactly the direction of the principal meridians of astigmatism; and for strength of cylinder until the amount of astigmatism is settled within the limits of possible accuracy, usually one-quarter diopter. This should be done at each sitting, necessarily with the other eye "fogged" or covered. But obviously the testing should be suspended when the patient gets too tired, or too inattentive, to notice which way the letters or test objects look better or worse. It is also useless to continue when the examiner is too tired, preoccupied, or inattentive to notice whether the patient understands what is asked of him. These sittings must be repeated, better on different days, until the examiner is satisfied which of various findings represents the best observations of the patient's eyes, under conditions most nearly like those under which the eyes will be required to work.

How much time does it take for cross cylinder testing?

It is not a short cut, or a machine method, of testing refraction. A few minutes will show whether poor vision can be improved by cylindric lenses, or whether they are needed for the relief of eyestrain. Added to other methods of testing refraction, it saves time rather than prolongs the process. It answers these two questions, "What is the direction of the meridians?" and "what is the best strength for the cylinder?" To have these answered quickly and accurately saves time. The alterations should be made quickly and the patient should be required to answer promptly as to his first impression after the change. He should not be expected to think about it and give his judgment. Often the turning may be repeated several times at intervals of a few seconds, and the patient asked which way is better. If there is a decided difference he will state what it is. To get a prompt answer tell the patient you will make sure by repeating the test. If he contradicts himself you will be able to judge from that. If the vision is really just as good one way as the other that is what you are after, the cylinder in the trial frame is right as to the factor you are investigating, and vision with it alone ought to be a little better than with the cross cylinder, either way. Time will be saved by stopping the test when you think you know the result, and repeating it at another time when the eye is fresh.

Can the cross cylinder be used without a cycloplegic?

Yes. It is the best test for astigmatism without cycloplegia; although it will be more accurate when the pupil

is 4 mm. or more in diameter. But it cannot take the place of cycloplegia in cases where cycloplegia is indicated. It is applicable for accurate refraction, with or without cycloplegia; and it is particularly valuable for testing astigmatism in postcycloplegic tests.

The cross cylinder does not supersede other methods of testing refraction. It is simply the most certain and exact method of determining the meridian of astigmatism and the strength of the required cylinder.

217 Imperial building.

EYE EXAMINATION RECORD AND TOPOGRAPHIC CHART

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NEW YORK

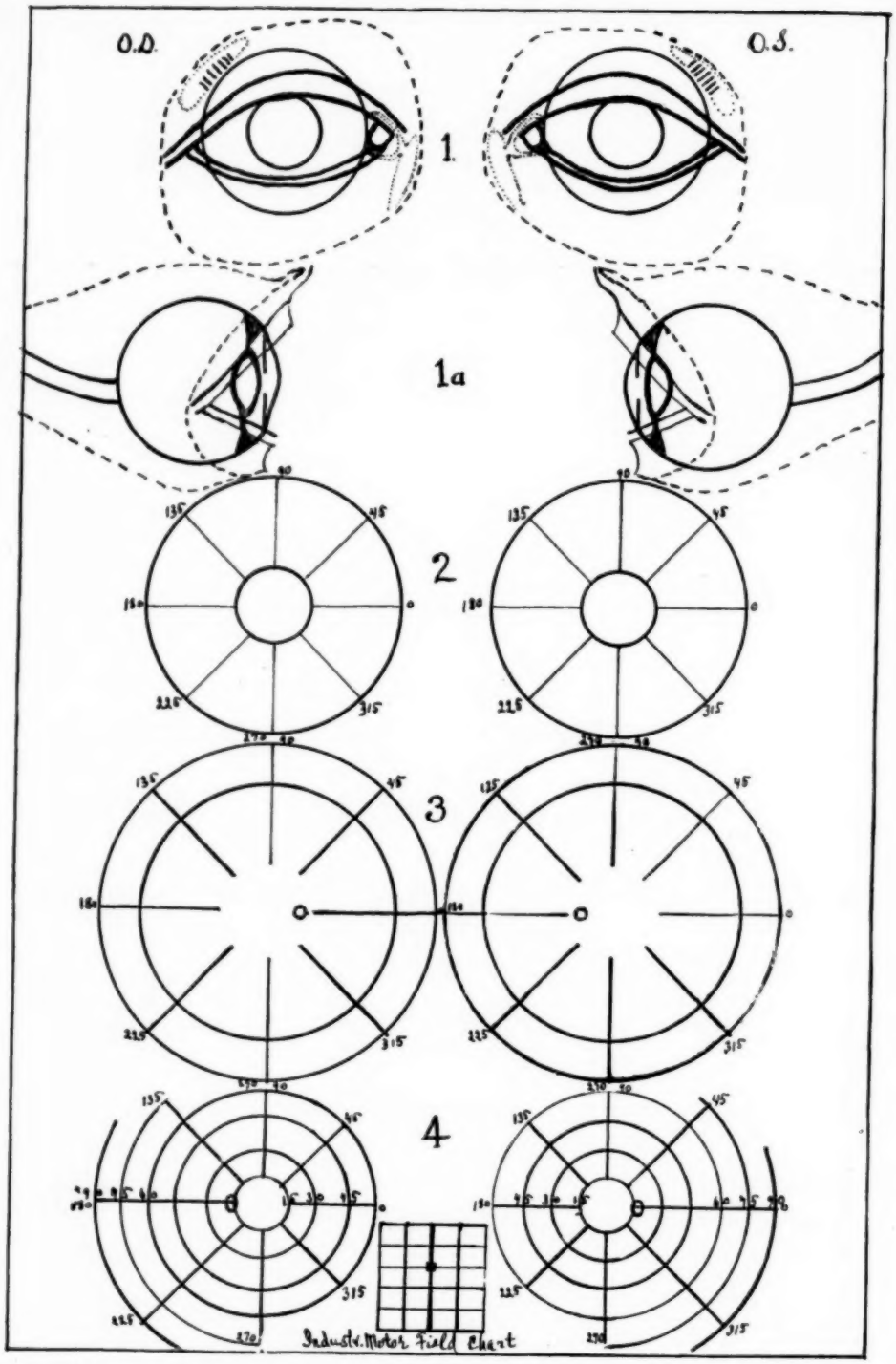
The examination record blank presents a suggested routine of examinations to serve the needs of ophthalmologists engaged in industrial and compensation work; while the topographic chart provides for some details not commonly included in such charts, especially as to the relation between the eye and the orbit and as to inclusion of the whole of the ophthalmoscopically visible fundus.

The accompanying record and chart are especially designed and arranged to serve the needs of ophthalmologists engaged in industrial and compensation work. The examination record groups the objective findings separately from the functional findings on the basis of which compensation is exclusively allowed. The functional group is further arranged in the order of tests of central, peripheral, and binocular function, in terms of impairment of which compensation is generally computed. The suggested routine of examination seems rational from the standpoint of economy of effort as well as from that of logical order of procedure.

The purpose of the chart is mainly topographical. Some of the current diagrams used for that purpose have been modified to conform to actual average dimensions and proportions which are often ignored, and in order to incorporate more data than are usually provided for. The relation of the eye to the orbit seems as important in charting injuries as the relation of the eye to the lids, and a profile diagram showing the relations of the exposed vulnerable temporal segment of the eye has been included. A diagram of the anterior segment of the eye projected on a plane has been added, and is really necessary since a lesion of the globe beyond 7 mm. from the limbus cannot be charted on the diagrams already in use.

For fundus topography a chart of the total ophthalmoscopically visible fundus projected on a plane, and modified from that of Amsler and Dubois (see American Journal of Ophthalmology, December, 1929, page 1030) is offered, rather than the stereotyped one which provides for charting lesions in the neighborhood of the posterior pole only. The retinal vessels have been omitted purposely, and the center of the diagram is left blank to facilitate charting. Both the anterior segment and the fundus diagrams are in actual average dimensions.

In the field charting, the suggestion made by Troncoso at the International Ophthalmological Congress in Washington to chart "anatomically", i.e., as the examiner sees the patient's projected field, has been adopted—rather than transposed as the patient sees his own field. This necessitates only the remarking of the usual field charts from O.D. to O.S. and vice versa, and relieves the examiner of the confusion resulting from having the O.S. chart in line with the O.D. diagrams. In the field chart, the same dimensions as those of the fundus chart have been used. The advantages of having the field chart and the fundus chart of the same dimensions in relating field de-



Topographic chart (Davidson). 1 and 1a, relation of eye to lids, orbit, and lacrimal apparatus. 2, anterior eye segment projected on plane. 3, total ophthalmoscopic fundus, inner circle marking equator. 4, "anatomic" field chart.

fects and fundus lesions are obvious. The meridians and their numbering have been made uniform throughout, and the eight cardinal meridians habitually used were deemed sufficient. Being a topographical chart, the need for charting details of fundus lesions and fields is left to be taken care of by the large scale charts.

The industrial motor field chart is added for charting the diplopia in accordance with the recommendations of the Committee on Compensation for Eye Injuries, Section on Ophthalmology of the American Medical Association, and adopted by the United States Employees' Compensation Commission and by compensation commissions of many states.

The diagrams have been grouped together on one page, their dimensions being slightly reduced (by one thirteenth) for the purpose of publication. This also demonstrates the possibility of fitting them all into the usual five by eight inch record card.

210 West Seventieth street.

Eye examination record

Name Addr. Age Occ. Date Ref.

O.D. O.S. O.U.

Foreign body, injury, burn, styes, growth, redness, pain, burning, watering, discharge, photophobia, twitching, eye ache, poor vision, impaired vision, blur in reading, color-blind, distortion, spots, floating specks, clouds, obscuration, color rings, hemianopsia, diplopia, cross-eyed, headache.

History: Pres. / Prev. / Family

Functional Tests	O.D.	O.S.
Dist. V.		
With cor.		
Near V.		
With cor.		
N.P. of acc.		
Light sense		
Fields		
Bl. spots		
Stereopsis		
Phoria, D & N		
Duction		
Color V.		
N.P. of conv.		

Objective Examinat.: Lids-Lac. ap. / Tension / Conjunct. / Corneoscl. / Ant. Ch.-Iris / Pupils-Refl. / Lens-Vitr. / Fundus / Refraction / Motility / Tropia / Conjug. Movemts.

Gen.-Lab: Smear & Tissue — Urine / Wass. — X-ray — E.N.T. / Nerv. sys. — Cardiovasc. / G.-U. — G.-I. — Skin — Lungs — Tbclin.

Diagnosis

Treatment

Result

A CASE OF KRUKENBERG SPINDLE

I. S. TASSMAN, M.D.
PHILADELPHIA

The fusiform streak in the posterior layers of the cornea, which has become known under the title of "Krukenberg's spindle", is described as seen with the ophthalmoscope and the slit-lamp in a negress in the service of Dr. J. Milton Griscom at the Wills Eye Hospital. Read before the section on ophthalmology of the College of Physicians of Philadelphia, November 21, 1929.

The patient, Mrs. L. Y., colored, aged thirty-six years, was first seen at Wills Hospital, November 1, 1929, complaining of aching of the eyes, and stating that she had been troubled with difficulty of vision and pain in the eyes for about a year. Vision: O.D. 4/40, O.S. 1/40; with glasses, O.D. 5/40, O.S. 5/40.

Family history and past medical history were negative. The present complaint was concerned not so much with the poor vision as with the dull, aching pain in her eyes. The patient stated she could see well enough with her glasses, which she had obtained about a year ago.

External examination, with undilated pupils, showed the right pupil about 4 mm., left pupil 2 mm. in size, no reaction to light, tension normal, convergence poor; otherwise negative. By oblique illumination, there could be seen, in the center of the cornea of each eye, a linear streak, brown in color, and extending vertically from about the center of the cornea to within 1 mm. of the lower limbus at the six o'clock position. The condition was apparently symmetrical in the two eyes.

Ophthalmoscopic examination, under homatropin dilatation, showed the following:

Right eye: In the center of the cornea a brown fusiform streak or spindle, extending vertically from just above the middle to about 1 mm. from the lower limbus at the six o'clock position. This spindle appeared to be in the posterior layers of the cornea, and was made up of a number of small, closely placed, individual pigment dots. The anterior chamber was deep, and no remnant of a pupillary membrane was seen. There were star-shaped striations in the center of the lens posteriorly; and numerous filamentous, floating opacities in the vitreous. The nerve-head was oval, with the long axis at seventy-five degrees, the margins fairly well outlined and the color pale. There was a large area of degeneration in the macular region, and throughout the periphery could be seen numerous areas of chorioretinitis. The perivascular sheaths were prominent.

Left eye: The vertical streak or spindle in the center of the cornea appeared the same as in the right eye, except that the individual pigment dots of which it appeared to be composed could be more clearly distinguished. No pupillary membrane was seen; the lens was clear; there were numerous floating opacities in the vitreous; the nerve-head was atrophic; there were extensive areas of chorioretinitis in the periphery; and the perivascular sheaths were very prominent.

With the ophthalmoscope, the patient was seen to be highly myopic,

The general physical examination was negative. Wassermann and Meinicke were strongly positive.

X-ray examination of the accessory sinuses showed a marked inflammatory reaction in both ethmoid regions; to a lesser extent in the right maxillary; and some question of the sphenoid.

X-ray examination of the teeth revealed moderate alveolar absorption throughout; a granuloma at the apex of the upper right lateral incisor; pericemental thickening at the apex of the upper right central incisor, with early bone absorption; a similar appearance about the first and second upper left molars; an old stump of root of an

upper right molar, and two stumps in the lower right molar region, with infection about them.

Slit-lamp examination: Right eye: All around the limbus was a palisade arrangement of dark brown pigment, probably racial. The anterior portion of the cornea was clear. Scattered over the entire posterior surface of the cornea were fine, brown granules, but more densely arranged to form a vertically oval configuration which extended from just above the limbus to about half-way between the center and the limbus above. These dots were more and more sparsely distributed toward the periphery. It seemed that most of them lay in front of the endothelial cells, although some might be behind.

The iris was distinct atrophic. All surface markings were gone, with complete loss of the retinal layer around the pupillary margin, and complete atrophy in several areas scattered around the iris.

The anterior surface of the lens contained some fine brown pigment granules resembling those deposited on the cornea. The central two-thirds of the posterior surface of discontinuity of the adult nucleus gave a brown homogeneous reflex. This, with the narrow slit, was seen to be composed of two thin plaques with a distinct clear zone between them. At the posterior surface of the lens could be seen a translucent white membranous deposit arranged in the form of radiating spokes with the center at the pole.

Left eye: Almost the same as right eye, except that there was no membranous deposit at the posterior surface of the lens.

The principal features of this case are:

(1) The patient was thirty-six years of age and colored.

(2) She was myopic.

(3) The spindle was bilateral.

(4) There was an old extensive chorioretinitis.

(5) Wassermann and Meinicke were both positive.

(6) There were no signs of pupillary membrane.

Eighteenth and Race streets.

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

COLORADO OPHTHALMOLOGICAL SOCIETY

October 12, 1929

Dr. C. E. Walker presiding

Retinal angiosclerosis

Dr. E. E. McKeown exhibited a case of sclerosis of the retinal vessels.

Discussion. Dr. William C. Finnoff explained that the sclerosed vessels showed a blood stream in their peripheral portions, therefore the vessels involved, although some of them looked like white cords, must be patent. The exudates were superficial and were very likely varicose nerve fibers.

Dr. Melville Black called attention to Pines's work in regard to angiosclerosis which had been recently published in the British Journal of Ophthalmology. Dr. Black was of the opinion that the best information in regard to general arteriosclerosis was obtained from a careful study of the condition of the fundus vessels.

Enlarged conjunctival vessels

Dr. E. R. Neeper brought a woman twenty-eight years of age, in whom since 1924 two large, nearly parallel vessels of the conjunctiva, extending from the nasal limbus to the caruncle of the left eye, had been observed. These vessels were conspicuous and the patient had come with regard to having them removed. The following questions arose in Dr. Neeper's mind: (1) Were we justified in interfering for cosmetic reasons? (2) Was their increasing size evidence of possible trouble within the globe?

Discussion. Dr. William C. Finnoff stated that he had seen this patient five years ago and at that time the size of the vessels was within physiologic limits. He mentioned the possibility of sarcoma of the ciliary body, but advised that it was worth while trying to obliterate these vessels by the use of the electric needle.

Dr. E. R. Neeper thought that perhaps the upper of the two vessels was an artery, and that it might be advisable to ligate it, probably back under the caruncle.

Chronic uveitis

Dr. E. R. Neeper also showed Mr. E.S.M., laborer aged forty-four years. The left eye had been struck by a piece of flying rock on September 21, 1929. The injury was very painful and the eye was "blinded" for some minutes, but the patient continued work for the remainder of the day on which he was injured. The eye became increasingly painful and on September 25th he sought relief. At this examination the bulbar conjunctival vessels were markedly injected. The pupils were equal in size, but the left reacted very sluggishly to light. The aqueous was slightly hazy, and there were deposits on the posterior surface of the cornea. There was also noted some light colored débris in the vitreous, but other than this the ophthalmoscopic examination was negative. X-ray examination for the possibility of a foreign body was negative. The teeth were x-rayed and one involved tooth was extracted. The x-ray picture of the sinuses showed a slight shadow in the left ethmoid. The Wassermann was negative, although there was a definite history of lues in 1917. The vision of the right eye was 20/30 and of the left eye 20/80.

Dr. E. R. Neeper raised the following questions: (1) Should luetic treatment be insisted upon? (2) Was there justifiable evidence for an operation on the ethmoid cells?

Discussion. Dr. Melville Black suggested the use of milk intramuscularly, and if this failed to bring about improvement the use of typhoid vaccine was advised.

DR. E. R. NEEPER said that he would use mixed treatment in spite of the negative Wassermann.

Interstitial keratitis.

DR. NEEPER'S last case was one of bilateral interstitial keratitis. This patient, C.D., aged nineteen years, admitted no previous ill health or eye trouble. He was examined first on July 15, 1929, and stated that three weeks previously he had been in an automobile accident, and that following this accident he had noted very poor vision in the right eye. There was much photophobia and epiphora which gradually became worse. The right eye showed a definite interstitial keratitis, and in six weeks the left eye had developed a severe keratitis.

DR. NEEPER showed this case because it emphasized the necessity for careful investigation regardless of history, and also because not infrequently a case of interstitial keratitis, due to inherited syphilis, made its first appearance after some trauma.

Discussion. DR. MELVILLE BLACK thought that the teeth were indicative of inherited syphilis.

DR. WILLIAM H. CRISP thought that a direct corneal injury would be more likely to precipitate interstitial keratitis than a remote injury, which was probably the type suffered by this patient. In all cases of interstitial keratitis he advised complete rest in bed.

D. H. O'ROURKE,
Secretary

COLORADO OPHTHALMOLOGICAL SOCIETY

November 16, 1929

DR. FRANK R. SPENCER presiding

Preretinal hemorrhage

DR. JAMES M. SHIELDS showed Mr. A.W.W., aged twenty-six years. His past history was of no importance in this connection, with the exception of possible apical tuberculosis which had really never been proved. The patient stated at his first consultation on November 15, 1929, that he had never had any previous ocular trouble. At noon on that day he had lifted a weight of about fifty pounds, and half an hour later he had noticed a red spot projected before his left eye.

Ophthalmoscopic examination showed a sausage-shaped hemorrhage sharply demarcated, projecting from the region of the macula and extending temporalward. The anterior tip of this hemorrhage extended into the vitreous about two diopters. After forty-eight hours this sausage-shaped tumor had become hour-glass in shape due to a constriction at its center. At this time the upper half of the mass was bright red and the lower half a rather darker red. At the end of four days the lower anterior tip became bifurcated, and presented two distinct knobs. The vision at the time of the last examination was 6/10.

Discussion. DR. EDWARD JACKSON had examined this eye on the day of the appearance of the lesion. He felt that the hemorrhage projected about one diopter in front of the smaller vessels that were near to it in the region of the macula. He believed that the fovea was entirely covered and that therefore the possibility of choroidal hemorrhage must be kept in mind, that is, a hemorrhage of the choriocapillaris which had burst through the lamina vitrea. As to the constriction noticed after forty-eight hours he suggested the possibility of a contraction of the clot.

DR. WILLIAM T. BRINTON suggested the possibility of an aneurism of a branch of the superior temporal vein.

Plastic repair of ectropion

DR. WILLIAM C. FINNOFF exhibited N.S., a boy of thirteen years. In 1924 the child had become ill with multiple discharging skin lesions of the face, body, and extremities. These lesions subsided after several months, but recurred twice with even greater severity. During the last exacerbation in 1926 the boy was admitted to the Colorado General Hospital, where a diagnosis of pemphigus with pyogenic

granuloma was made. At this time the lids were involved, but not the conjunctivæ. The disease healed after many months, with resultant scarring and marked cicatrical ectropion of both lower lids. On September 19, 1929, a repair of the left lid was attempted. The lid was dissected free and the lid margins united by the Wheeler bridge type of tarsorrhaphy. The denuded area below was covered by epidermal grafts taken from the thigh. The postoperative result was an improvement in the condition.

Tay's choroiditis

DR. WILLIAM C. BANE showed Mr. J.M., aged thirty-two years, who was a patient at the National Jewish Hospital for tuberculosis. The patient came because of a twitching of the left lower lid which had occurred at irregular intervals over a period of two months. The vision in each eye was 5/5. On August 28th, the pupils were dilated with homatropin for examination and refraction. The fundus examination revealed an extensive area of yellowish white dots. These dots involved principally the maculæ but extended beyond the limits of the maculæ in a wide circle. They were diagnosed as colloid excrescences or drüsen.

D. H. O'ROURKE,
Secretary

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

December 16, 1929

DR. ROBERT WARNER presiding

Cyst of the lacrimal gland

DR. HILLIARD WOOD reported the case of an eleven-year-old boy who had been brought to him November 29, 1929, with the history that since infancy an enlargement over the region of the right lacrimal gland had been observed. This enlargement was more noticeable at some times than at others, but in a general way it had increased. There had been no pain nor soreness.

The vision of each eye was normal and the boy accepted no glasses. In the region of the right lacrimal gland was an oval enlargement about the size of an almond. It was soft and not sensitive. A diagnosis of tumor, or possibly cyst, of the lacrimal gland was made, and removal was advised.

The operation was done under ether; an incision through the outer two-thirds of the eyebrow exposed the mass, which was removed by blunt dissection. The wound was closed by skin clips. Healing was uneventful and the patient now seemed well. The mass was a cyst, somewhat over one centimeter in diameter, and contained a light-colored mucoid material.

The case was reported because of the rarity of disease, and especially of a cyst, of the lacrimal gland.

W. W. WILKERSON,
Secretary.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

November 19, 1929

DR. W. HOLBROOK LOWELL presiding

Congenital tortuosity of retinal vessels

For DR. GEORGE S. DERBY, Dr. Cameron showed an Italian girl, ten years old, who had been sent to the clinic on account of poor vision. Examination revealed four diopters of hyperopia in each eye with one diopter of astigmatism, with correction of which vision was approximately 20/30 in each eye. The fundi showed marked tortuosity of retinal vessels and discs, with blurred margins and no physiological cups.

Dacryoadenitis with eosinophilia

DR. CAMERON showed an Italian girl, fifteen years old, who had come to the clinic with a swollen right upper lid. Examination revealed a palpable tumor in the upper outer quadrant of the orbit. The patient was found to have bilateral infection of antra and ethmoid sinuses. She was treated for sinusitis for six weeks. After this an orbital tumor was removed, which was reported

to be chronic inflamed tissue, probably luetic. This operation had been apparently curative and there had been no return of symptoms for one year, but then the patient returned with similar swelling of the left lid. Biopsy of tissue from both orbits was made. Histological report was dacryoadenitis. The patient was discharged. In two months she returned with marked increase in swelling; exophthalmos of about five millimeters; the eye pushed down and out; and movements, except laterally, somewhat impaired. The edge of the lacrimal gland could easily be palpated as a nodular swelling. Temperature was normal; white count 13,000; eosinophiles seven to ten percent. Examination of stool showed no intestinal infestations, and did not explain the rise in leucocytes, which did not recur during her stay in the hospital. At present the condition was improved. Six days ago section of the lacrimal gland had been planted in the abdominal wall of a guinea pig in the hope of ascertaining whether or not the condition was tuberculous.

Some twenty-five cases were found in the literature. All the authors reporting cases emphasized the frequency of dacryoadenitis following mumps; also the facts that the acute form was much more common than the chronic and that the organism was usually staphylococcus.

In 1910 a case of Mikulicz' disease was reported in which the parotid swelling did not appear until the lacrimal swelling had subsided. In 1924 Thorp reported a case of dacryoadenitis in which the white blood count showed eighteen percent eosinophiles. In this case also there was no intestinal infestation, and the author could give no reason for the high cell count.

Ocular tuberculosis treated with ethyl chaulmoograte

DR. HERBERT WAITE presented a girl of twenty-two years who had been suffering for the past ten years from recurrent keratitis in each eye. Since 1924 she had been receiving treatment at the Massachusetts Eye and Ear Infirmary, both as an out patient and as a house patient. The treatment had consisted mostly of zinc oxide and ichthyol ointment, so commonly used in ocular rosacea. The diagnoses entered on her record, in order of their appearance, were phlyctenular keratitis, herpes, rosacea, and eczema. Concurrent with the eye condition, there had also been a stubborn affection of the skin of the face, chiefly around the nostrils and on the nose and cheeks. In 1925 the patient had an obstinate periostitis of the middle digit of the left hand, requiring free drainage. During these five years of attention at the Infirmary, the patient's weight ranged around 110 to 120 pounds. Her vision had never been better than 20/100 in either eye, and she had had almost continuous photophobia.

On account of recurrent inflammation in her eyes, the patient was admitted to the Infirmary in January, 1929. Both eyes then showed ciliary injection, the left more than the right, each cornea showed many surface scars and almost complete vascularization of the surface stroma, and the vision registered 20/200 right, and 3/200 left. X-ray of the chest showed calcified glands at each hilus, with clear lung fields. Blood Wassermann was negative. The speaker was opposed to a diagnosis of rosacea on account of the age of the affection. He favored the diagnosis of tuberculosis, possibly of the bovine type, on account of the age of the patient, the site and recurrent nature of the ocular lesions, digital periostitis, and calcified glands at the hilus.

It was decided to try a chaulmoogra preparation because of its reported utility in acid-fast infections. Ethyl chaulmoograte was selected because it was less irritating and more efficacious than straight oil. Several workers had shown that this ester was lethal for acid-fast bacilli in vitro in dilutions up to one part in twenty thousand, and Culpepper had demonstrated that guinea pigs could withstand massive doses of virulent tubercle bacilli incubated

forty-eight hours with sodium chaulmoograte.

The patient received three courses of ethyl chaulmoograte, intramuscularly, with doses of one cubic centimeter each week for six weeks. Under this treatment her weight had increased to 138 pounds, her eyes had progressively whitened, and photophobia had disappeared. The visual acuity was now 20/30 right and 20/70 left.

This improvement might have been merely a coincidence. At present, we all felt that the best treatment for tuberculosis of any sort consisted in correct hygiene, fresh air, good food, and sunlight. The only safe way to assess the value of chaulmoogra derivatives in tuberculosis of the eye would be by the study of its effects upon a sufficiently large number of carefully treated patients.

Discussion. Dr. H. B. C. Riemer said that as there was no positive proof of tuberculosis in the present case, he was not ready to believe that the condition was one of ocular tuberculosis. He favored the diagnosis of ocular rosacea.

Dr. H. H. Waite stated that it was impossible to defend a clinical diagnosis of ocular tuberculosis without biopsy, and biopsy often did not fully establish the diagnosis without animal inoculation. In general, rosacea, as he understood it, was an affection of the climacteric, and rarely occurred in children. Szily had recently advanced the opinion that rosacea resembled tuberculosis histologically.

Recovery of badly injured eye

Dr. E. B. Dunphy showed a boy who had suffered a tremendous wound of the left eye on the eve of the Fourth of July from the explosion of a bottle of beer. A large piece of vitreous was sticking out. The eyeball was practically collapsed and enucleation was advised. However, the eye was saved. The case was shown as a plea to try to save badly injured eyes. The eye today was normal-looking, tension normal, vision 20/40. Some opacities appeared in the vitreous. The lid, of course, was repaired.

Discussion. Dr. Henry Hawkins recommended Dr. Dunphy's attitude in regard to badly injured eyes. In one case a nail from a board punctured the globe, with collapse so great that the eye looked like a grape that had been stepped on. A conjunctival flap was sewed and the eye recovered. In another case an emery wheel broke and struck the patient's goggles, and the glass punctured the globe causing complete collapse. The man now had 20/20 vision in the eye.

Dr. H. B. C. Riemer reported a case in which a scleral suture had been necessary. The eye recovered well and had 20/20 vision for about six months. At the end of that time the lens became cataractous, and in about three months it was removed. Three months later the patient complained that he could not see, and there was a large detachment of the retina. It was a mistake to give too good a prognosis after recovery of an injured eye.

Dr. William Liebman said that it was quite possible that a great many took out eyes that could have been saved, but most men had cases where not taking out the eye had resulted in total blindness. He was not an optimist and felt that the patient was much better off with one good eye than to risk losing both.

Eye findings in poliomyelitis cases during the first week

Dr. Henry M. Emmons read a report of seventy cases of poliomyelitis which he had examined during the acute stage to find what percentage of eye symptoms could be found. The fact that twenty-nine percent showed some definite pathology seemed to warrant the inclusion of eye symptoms in all works on general medicine and neurology as a diagnostic feature. In his study and in the study of all the epidemics of the last twenty-five years, facial paralysis was the most common, sixth nerve next, and third nerve a close third, with optic neuritis a very rare complication. He made a plea for early recognition of these cerebral nerve palsies, as the seat of the trouble must be near the respira-

tory centers and prompt action with convalescent serum might save many lives.

Cure of tryparsamide blindness by spinal fluid drainage

DR. V. G. CASTEN showed a patient, fifty-nine years old, complaining January, 1929, of incontinence of five weeks' duration. Wassermann was strongly positive on two occasions; Hinton positive. Diagnosis of lues was made and patient started on tryparsamide. Fields and fundi were reported normal. On June fourth, the patient received one gram of tryparsamide and a few days later he became totally blind. At the emergency ward at Massachusetts General Hospital, Dr. Viets said the patient had shadows in both eyes, with slight blurring of both disc margins, looking something like optic neuritis. June eleventh, under forced spinal fluid drainage, 190 c.c. spinal fluid were removed; pressure normal; fluid flowed freely. Patient was given eight to ten glasses of water by mouth. Wassermann was strongly positive; total pressure 38 mm. The patient made no complaint except that the position became uncomfortable. The following day the patient was able to tell correct time at eighteen inches and also saw his reading glasses at four feet. At 3:30 p.m. another forced spinal fluid drainage was done and 190 c.c. of spinal fluid removed in three hours. The following day the patient could count fingers at from six to ten feet. June fourteenth another forced spinal fluid drainage was done and 140 c.c. of spinal fluid removed. June nineteenth the fourth was done and 110 c.c. removed. Vision was 20/20 in both eyes. Fields showed marked peripheral contraction with ten to fifteen degrees central field remaining in each eye. June twenty-sixth, when a fifth drainage was done, 215 c.c. of fluid were removed, making a total of 845 c.c. July ninth vision was, right eye 20/20 plus four, left eye 20/15 minus three. October thirtieth vision was 20/15 in both eyes. The fields showed little over twenty degrees general field, but extending to sixty degrees in both temporal fields. Blind spots were normal, and there were no central scotomata. November second lumbar puncture showed pressure and dynamics normal: nine lymphocytes were present. Wassermann was negative. November eighteenth vision of right eye was 20/15 plus two, left eye 20/15 minus one. Patient was back at work as an accountant and had no visual symptoms. Examination of fundi at present time showed very well marked pallor of discs of both eyes, otherwise condition the same as when seen on June tenth.

This was a typical tryparsamide amblyopia with objective visual disturbance coming on with the first five doses of tryparsamide. Tubular fields were present, somewhat larger temporally, with no central scotoma or enlargement of the blind spot. The question was raised as to whether forced spinal fluid drainage could not be used for treatment in retrobulbar neuritis cases as well.

Combined iridencleisis and Lagrange operation for glaucoma

DR. ALLEN GREENWOOD presented a paper which is published in this issue of the Journal.

S. JUDD BEACH,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on Ophthalmology

November 21, 1929

DR. C. E. G. SHANNON presiding

Massive retinal exudation

DR. BURTON CHANCE brought a boy of ten years who had come to the hospital only a few days before because his parents had noticed, in the past few weeks only, a whitish reflex behind the pupil of his left eye. Deep in the nasal half of the fundus there was a mass which looked like beef suet; on it there were a few vessels and it projected somewhat like a glioma mass. In the temporal half of the fundus two or three other areas could be seen; they appeared as though they had punctured through the

retina and choroid. There was no history of injury nor of inflammation.

Dr. Chance had regarded the diagnosis as massive exudation. He had never seen a glioma like this although he had been consulted in fifty-six cases of glioma. The case was older than any one he had seen exhibiting early symptoms. The eye had shown no signs of inflammation nor of congestion. The tension had not been elevated to finger touch, and the anterior chamber was of normal depth. The tension tonight was a little higher, probably because of pupil expansion and other manipulations of the eye. Hypertension had not been present previously.

Discussion. Dr. Shumway said that he thought the sooner the eye was out the better. The vitreous was comparatively clear, the mass itself was smooth and somewhat vascularized, and these scattered masses on the retina were exceedingly suggestive of what we got in microscopic examinations of glioma of the retina. In a great many of the cases retina. In a great many of the cases which he had examined microscopically in the early stages, when the eyeballs were not entirely filled by the tumor mass, there were found on the surface of the retina collections of tumor cells which were metastatic growths or additional growths. The present case showed this condition and Dr. Shumway would be strongly inclined to make glioma of the retina the diagnosis.

A case of Krukenberg's spindle

Dr. J. M. Griscom and (by invitation) Dr. I. S. Tassman reported a case of which a complete account is published in this issue of the American Journal of Ophthalmology.

Discussion. Dr. Peter said he had reported a case of this kind before this Section in 1927. That patient was unusual in that she was hyperopic. She was fifty-four years of age, with low grade chorioretinal disease of long standing. The evidence as to the etiology in these cases was in favor of an acquired condition. The age of the patients—the fact that it usually appeared in myopic individuals and in elderly people—was against a congenital origin of the condition.

The distribution of the spindles was difficult to explain, first, in that they were bilateral; second, in that they occupied a vertical position directly in the center of the cornea; and third, in that the spindles, as a rule, tended to approach more nearly to the lower limbus than to the upper.

In the case which he had reported, the center of the spindle was rather dense, and the peripheral borders were frayed and branched in appearance, made up of more or less stellate spots, just as though washed and thinned out by the aqueous current. It was not unlikely that the aqueous current was responsible for the peculiar distribution of these deposits, because they occurred in what seemed to be the most active part of the current.

It was probable that, if these cases were carefully studied, a low-grade chronic inflammation of long standing, such as was often observed in myopia, would be found to be present in each and every case. In the case which he had reported, the deposits were located on the posterior surface of Descemet's membrane.

Dr. Holloway said that some nineteen years ago he had reported three histories of such cases, and at that time he had tabulated the case histories then on record, some nine or ten reports. Nearly all instances of this pigmentation had occurred in myopes, and when astigmatism had been present it had generally been oblique. Since the above he had seen at least three and probably four other cases. One of these was first seen in 1916, again in 1917, 1918, and 1919, and his notes failed to mention any signs of pigmentation. All of his patients were examined by oblique illumination as well as with the ophthalmoscope, and one was not apt to overlook ocular conditions he had once recorded, so it was difficult to believe it could have been overlooked. The patient was seen again in 1926, when a

definite spindle was noted in the right cornea, and the notes briefly stated: "with slit-lamp fine punctate pigment dots, slightly variable in size, on and anterior to Descemet's membrane".

In view of recent developments, the speaker had suggested to one of his friends about two weeks ago that it might be well to round up the cases he had seen and subject them to accurate slit-lamp examinations. In regard to the etiology, until recently he had always been under the impression that the condition was congenital. This brought up the old question as to whether certain of the so-called congenital conditions were truly inflammatory or were developmental abnormalities. He did not agree with Dr. Peter that if we examined all of these cases we should find evidence of intraocular inflammation, because it was not true in certain of his own cases, nor in certain other of the recorded histories. The only way this could be accepted would be to assume all myopic cases as of inflammatory origin and that the myopia was primary in each instance.

In view of the instance above cited and certain other cases now on record, he was beginning to lean toward the possibility of this pigmentation being an acquired manifestation, at least in certain instances.

Dr. Griscom (concluding) said it was difficult to conclude that these cases were congenital in origin, because of the fact that very few showed any other sign of inherited ocular defect. It seemed rather strange, too, that Krukenberg spindles should be found in adults and not discovered earlier in life, if they were congenital. Dr. Griscom felt that they were more likely to be acquired and perhaps had some association with progressive myopia.

Vitreous hernia following trauma

Dr. Luther C. Peter demonstrated by hand slit-lamp a rupture of the left cornea, down and in near the limbus, which had resulted in iris incarceration, slight traumatic cataract, and some dislocation of the lens, with prolapse of the vitreous through the ruptured zonular fibers.

The case was presented because of this series of phenomena, and especially because the vitreous hernia was demonstrable by means of the hand slit-lamp. Although this rather simplified instrument of precision was not so refined as the large slit-lamp, it was most practical in uncovering and analyzing many details in the anterior segment of the eye.

The visual results in the case were good, but the iris incarceration, the dislocation of the lens, and the vitreous hernia might bring about definite pathology in the future. Instead of replacing the apparently uninjured iris, excision was the better mode of procedure. As the iris returned so readily with a round pupil, the inclination was strong to take a chance. It was better surgery, however, to excise the protruding iris. There was less danger of infection and less likelihood of anterior synechia.

From the compensation standpoint, it was best to write into the report of such a case the possibilities of further complications because of the anterior synechia, lenticular dislocation, and vitreous prolapse.

A final point which this case stressed was the necessity for careful study of our cases by instruments which were more refined than the ophthalmoscope and oblique illumination. The loupe was useful, but did not possess the wide applicability and differentiation of the slit-lamp, even in this most simplified form.

Extensive cellulitis of lids and scalp in a child

Dr. G. E. de Schweinitz and Dr. A. G. Fewell reported a case of severe cellulitis of the lids complicating chicken pox in a child eight years of age. The diagnosis of chicken pox was made on May 24, 1929. The cellulitis of the left lids was first noticed three days later. The infection of the lids had evidently started from a small pock from which pus was expressed, on the side of the

nose near the inner canthus. The temperature jumped from 100 to 105 degrees in a short time. When first seen the lids were completely closed, browny, and of a putty color. Both lids were incised, a small amount of pus being obtained from the upper, but none from the lower lid. A culture taken at the time was reported as pure streptococcus hemolyticus. Considerable pus was obtained from each lid the following day. Small rubber drainage tubes were placed in each lid. In spite of seemingly free drainage the patient continued to run a typical septic temperature and seemed very ill. The cornea was not affected and there was no proptosis of the globe at any time. A blood culture taken at this time was negative.

On June 7th, there was some swelling extending from the outer canthus to the ear, evidently a pocket of pus forming beneath the skin of the upper part of the face. On June 11th an incision was made just above and in front of the left ear, and through and through drainage was established. The temperature gradually dropped to normal within a few days and convalescence was rapid. The lids healed rapidly, and now there was very little evidence of scarring.

Instantaneous color photography of the human eye

Dr. Laurance D. Redway said that few who did active clinical work in ophthalmology, especially those concerned with undergraduate or postgraduate teaching, would fail to appreciate the extraordinary advantages to be gained by the application of instantaneous color photography to this work. In the past, to say "color photography" was to conjure up a vision of infinite complexities. But improvements in methods and materials of latter years had advanced the art far beyond earlier expectations. To take and to finish a color plate such as those here to be shown was now possible in about fifteen minutes. Simplicity then had reduced color photography almost to the status of a mathematical equation, soluble by anyone with a common high-school education. In instantaneous color photography of eyes it was now possible to work under carefully calculated and controlled conditions of illumination and exposure assuring almost perfect results.

To obtain good color illustrations either for text book or class room work, the services of a good artist had been required, often not a simple matter. But with adequate color records available for demonstration, it was not only possible to show what was desired at the time but also conseutive records of a single case from its inception to its discharge, its behavior under treatment, its reactions to medication, the results of operative work.

The projected color plate by color interference was viewed pseudo-stereoscopically, and thus its planar definition was preserved, the illusion of depth being relatively perfect. Apparatus necessary to the work was simple. Essentially it consisted of a horizontal microscope and a source of light, the relations of these being permanently fixed. A small pilot light afforded sufficient illumination for focusing. The patient was seated as for a slit-lamp examination. The eye was exposed to no light whatever save to that of the pilot lamp until the instant of exposure. The exposure being for approximately 1/50 second only, the eye was perfectly static, and as the light beam was incident to the pupil at an acute angle, the greatest intensity did not fall on the macula. There was a short following scotoma but no further effect on the patient. Since the focusing light was subdued and the exposure so short, even very light-sensitive eyes might be thus photographed without difficulty.

The finished transparencies might then be projected. Because they were smaller than the normal lantern slide, a kit must be used to adapt the ordinary projection apparatus to this use, but that was the only change necessary to be made. The small size of the plate was a very practical advantage in the matter of transportation and of storage.

As to permanency of color, many of the plates here demonstrated were over a year old and had shown no tendency to fade, although they had been repeatedly exposed to the intense light and heat of the projection lamp. Copies of these plates could readily be made, and therefore valuable originals could be stored safely and used merely for the production of subsequent copies.

Heretofore, it had not been possible to reproduce such screen plates satisfactorily both as to color and detail by the four color photoengraving process. But, due to the kindness and interest of Mr. Harry Groesbeck and the Walker Engraving Company of New York, new developments had been made during the last year obviating this difficulty. With the possibility of printed reproductions, the facility with which the plates might be copied, and the simplicity of making them, there seemed to be no good reason why color photography should not be widely adopted by ophthalmologists as a teaching adjunct and as a means of improving the general quality of text book illustration.

A. G. FEWELL, Secretary

KANSAS CITY SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

November 21, 1929

DR. L. R. FORGRAVE presiding

Melanotic sarcoma at the limbus

DR. JOSEPH MCKEE showed a patient whose case will be published in full in this Journal.

Discussion. DR. R. J. CURDY mentioned a case of melanotic sarcoma of the limbus that had presented very much the same clinical picture as this one. He demonstrated a pathologic section of this case which showed a typical melanotic sarcoma of the limbus, cornea, and episcleral tissues.

DR. A. N. LEMOINE said that three years ago he had seen a patient with a melanotic growth at the lower limbus in a woman sixty-five years of age. The diagnosis of melanotic sarcoma was confirmed by Dr. Robert Koutschoner, pathologist. Shahan's thermophore was applied to the growth for one minute at 150°F. There was considerable reaction, but the growth disappeared in four weeks and there had been no recurrence. He also reported having a patient with an epithelioma at the limbus that was treated with the thermophore in the same manner five years ago. This patient also had had no recurrence.

Direct method for removal of intraocular metallic foreign body

DR. H. B. DAVIS described his method of removing metallic foreign bodies in the posterior segment of the eye. He emphasized the importance of localization. He preferred the direct approach with the hand magnet because of the ease of manipulating and transporting the apparatus, because of the smaller size of the apparatus causing less apprehension to extremely nervous patients than the giant magnet, and because of better control of the foreign body after the current was on and more certainty of succeeding in removing an encapsulated foreign body of long standing. He preferred a flat-nosed tip that could be inserted into the wound, as this did not distort the wound and gave the maximum pull. Unless the foreign body caused a large lacerating wound or was in the anterior segment of the eye, he preferred going posterior to the ciliary body, as this caused a minimum amount of trauma to the eye. He emphasized the importance of asepsis and of avoiding the ciliary body, the long ciliary artery, the venæ vorticosæ, and the recti muscles. The operative incision was made at the base of a large triangular flap, which when replaced gave perfect coaptation of the scleral wound. It was better to make the scleral incision by repeated strokes with a cataract knife than by puncture of the sclera. He then inserted the flat-nosed tip into the wound at the position indicated by the localization, with a minimum of manipulation. The current was

then turned on. An important point was to have the patient look at a definite object to fix the eye. The last step was a subconjunctival injection of Jones solution.

Discussion. Dr. R. J. Curdy remarked that the Europeans now seemed to be preferring the anterior route according to the technique of Haab when it was practicable, because the complications were more amenable to treatment and were less serious in the final result than those of the posterior route, especially late detachment of the retina.

Dr. Albert N. Lemoine mentioned that the giant magnets of the majority of ophthalmologists did not have enough pull, consequently the foreign body could not be drawn into the anterior chamber, and this frequently necessitated a second localization before it could be removed with the hand magnet. As a result they turned first to the surer method of extraction, that was, the hand magnet through the sclera. He felt that if one had a strong enough magnet and if the foreign body was not over three millimeters in its greatest diameter the anterior route should be tried first, even though the lens was not injured, as a foreign body of that size usually went around the lens without injuring it. Anyone contemplating the purchase of a giant magnet should first test it with the tester devised by Dr. Lancaster to ascertain the amount of pull it had at one centimeter distance, as this was the average distance used in most foreign bodies of the posterior segment of the eye.

Dr. E. E. Pickens approved the method used by Dr. Davis, having used it in all cases but one. In the only case in which he used the anterior route the patient had a much delayed convalescence.

Dr. Joseph McKee said that in his hands the method used by Dr. Davis had been very satisfactory and that he used it in most cases in preference to the indirect route.

Albert N. Lemoine,
Recorder.

KANSAS CITY SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

December 19, 1929

Dr. L. R. Forgrave presiding

Herps zoster ophthalmicus

Dr. Lyle S. Powell read a paper on the subject which will later be published in full in this Journal.

Discussion. Dr. E. E. Pickens remarked that he had seen but one case of herpes zoster ophthalmicus. This case was unusually severe. He brought out the point that herpes zoster affected the first and second branches of the fifth nerve, while herpes labialis usually affected the third branch.

Dr. M. Clark mentioned that there were many cases of herpes of the cornea that were not herpes zoster ophthalmicus. Herpes zoster almost always showed pathology in the gasserian ganglion.

Dr. Albert N. Lemoine remarked that he had seen but one case of herpes zoster ophthalmicus. This case was in a female, aged 50 years. It was unusually severe, the lids being so swollen that for several days it was impossible to see the cornea. This patient had ocular pain for nearly a year following the herpes, and the vision was markedly reduced.

Albert N. Lemoine,
Reporter.

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TRAVEL AND STUDY

The earlier ophthalmologists of America went to Europe to study their specialty. The tradition that the best preparation for ophthalmic practice was to be obtained in that way has still enough strength to influence American students; and many yet in active practice have been influenced by it. In Europe the German Wanderjahr to Italy, France, or England was expected to round out the education secured at the university. It is interesting to consider the modified forms in which the educational value of travel may be offered to the student of today.

For some years the classes formed by G. W. MacKenzie, of Philadelphia, have been able to profit by the opportunities of medical centers in Europe, especially in Vienna; at first in ophthalmology, then in otolaryngology, and lately in neurology. Now the Interstate Postgraduate Medical Association of North America has entered this field. The American assemblies of this association have gathered thousands of physicians and surgeons, for a few days each of graduate study. Under the presidency of W. D. Haggard of Nashville, and the Mayos, this association has organized its sixth annual visit to the clinics of Europe, to leave New York on May fourteenth and to return there July tenth.

It will attend clinics at Hamburg, Berlin, Prague, Munich, Vienna, Rome, Florence, Zurich, Berne, and Paris. At each of these cities, clinics, lectures, and demonstrations have been provided for twelve branches or specialties in surgery and medicine. Ophthalmology has been recognized in each city. Among the well known teachers who take part in such instruction are Professors Behr, Wilbrand, Krückmann and his associates, Elschnig, Leser, Wessely, Dimmer, Fuchs, Hanke, Lauber, Lindner, Meller, and Sachs in Germany, Austria

and Czechoslovakia. Professors Di Marzio, Valenti, Roselli, Marchi, and Bardelli and associates in Italy take part in the course; in Switzerland Professors Vogt and Siegrist; and in Paris Professors Terrien and Velter and Drs. Morax and Poulard. These well known men, and the hospitals at which they do their teaching, assure an attractive and valuable trip for the ophthalmologists who can take it.

The sightseeing side of travel is not neglected anywhere: two days are given to Oberammergau, and one each to Venice, Milan, Naples, Vesuvius, Interlaken, and Lucerne.

That transportation lines and agencies are willing to make such elaborate preparations and provision, to attract the patronage of those who desire graduate medical teaching, is a new recognition of its practical importance. This fact should be brought to the attention of university authorities. Many such institutions supporting "class A" medical schools for undergraduate students still fail to provide reasonably good facilities on which the healthy, efficient specialization of the medical profession must depend. A visit to ten great European clinics, or even to two or three, can be inspiring to the young and suggestive to those of experience; although it cannot furnish the drill in diagnosis, refraction, and operative technique that is essential to ophthalmic practice. *Edward Jackson.*

FILTRATION OPERATIONS FOR GLAUCOMA

For sufferers from the acute and inflammatory type of glaucoma, Graefe's discovery of iridectomy provided an operative treatment that has stood the test of time, in that a large proportion of such cases are permanently relieved by this operation, especially if it is performed at an early stage in the disease.

As to "simple", "chronic", or noninflammatory glaucoma, although the intelligent use of miotics delayed the disintegration of vision and of the visual organ, the ultimate outlook remained for the most part relatively hopeless.

It is in relation to the insidious and usually noninflammatory type of glaucoma, often associated with apparently insignificant increase of tension, that a more hopeful outlook has developed during somewhat less than a quarter of a century, from the increasing use of several different operative methods which may now be classified as "filtration operations".

The earliest of these to achieve some measure of popularity was the operation of anterior perforating sclerectomy, first introduced by Lagrange in 1906. In continental Europe this, next to iridectomy, is still perhaps the most popular operation for glaucoma. Its most prominent rival is the trephine operation of Elliot, which has become a favorite in England and in the United States as well as in parts of continental Europe. Broadly considered, these two operations closely resemble one another, especially in their later modifications. Each aims to remove a small piece of the sclera at or near the corneal limbus, and each is now usually performed in combination with an iridectomy.

The other filtration operations which have achieved a fair degree of popularity are those suggested by Holth and Borthen under the names of iridencleisis and iridotasis—the one being a modification of the other with similar purpose and similar effect.

As suggested by both Lagrange and by Holth in discussing their respective methods, the older operation of iridectomy was frequently a filtration operation, in that the raggedly cut or partially torn iris root became incarcerated between the lips of the scleral wound, and so produced an effect not dissimilar from that of the newer operations.

As pointed out by Maggiore (Annali di Ottalmologia e Clinica Oculistica, 1929, volume 57, pages 579 to 612) in discussing his own recent experimental work on this subject, there is now a rather general consensus of opinion that the favorable result of the filtration operations is due to the interposition of uveal tissue between the lips of the

scleral wound. Whether any important part is played by blood vessels communicating between the anterior chamber and the subconjunctival space is more doubtful. But it is apparently demonstrated by study of pathological material, as well as by clinical observations and by physiochemical investigation in the living subject, that there is an inevitable tendency for the lips of the scleral wound to grow solidly together, or for the intervening space to be filled with absolutely impervious scar tissue, unless the incarceration of uveal tissue in the wound prevents such approximation or such complete scar formation.

Thus Meller, from microscopic study of eleven eyes enucleated for various reasons after the Lagrange operation, reported that in cases in which the uveal tissue had remained in its normal position and had not become caught in the wound, the process of repair of the scleral wound proceeded with great rapidity, and led to the formation of dense and entirely impermeable tissue; but that when the iris prolapsed between the lips of the scleral incision the sclera did not share in the process of repair, which was undertaken in part by the subconjunctival tissue; while in those cases in which the iris did not completely occupy the scleral breach the scar was formed by proliferation of episcleral tissue and of those fibers of the sclera which were free from contact with uveal tissue.

Similar conclusions are quoted by Maggiore from the writings of Guglianetti, and of Bonnefon and Fromaget, among others. The joint work of the two writers last named emphasized the fact that the presence of uveal tissue in the wound actually interfered with the process of repair, an experience confirmed by the course of scar formation in some cases of cataract extraction in which iris tissue has remained in the wound.

The paper by Lawrence Post, in a recent issue of this journal (January 1930), under the title of "Subconjunctival iridectomy for glaucoma", supports the growing conviction as to the desirability of the persistent presence of iris tissue in the subconjunctival space, beneath a broad and ample conjunctival flap. In a paper recently read by Greenwood before the New England Ophthalmological society, and published in this issue of the American Journal of Ophthalmology, a strong recommendation is offered for the combination of Lagrange's sclerectomy with Holth's iridencleisis, beneath a liberal conjunctival flap.

The iridencleisis operation has shown a decided growth of popularity in the United States and elsewhere during the last few years (see especially the paper by S. R. Gifford, Transactions of the American Academy of Ophthalmology and Otolaryngology, 1927, page 117, with bibliography and discussion), so that it is rather surprising to read a parenthetic remark by Maggiore to the effect that "no one now practices Holth's iridencleisis". Perhaps not in Italy!

Maggiore's own investigations included study of a series of human eyes upon which the Lagrange operation had been performed; and also a number of groups of experiments upon rabbits, in some of which a flap of iris was brought out through the sclerectomy opening and left beneath the conjunctival flap, while in others the iris flap was completely severed at its root but was left in the wound and beneath the conjunctival flap, and still other experiments in which either a strip of superior rectus muscle or a tiny cannula or a minute piece of mica was left in the sclerectomy opening.

No satisfactory results were obtained from the use of either the muscle strip, the cannula, or the piece of mica, the wound becoming completely blocked in one way or another.

As regards the human eyes which were studied microscopically, and also as to the experiments upon rabbits in which an iris flap was left in the sclerectomy wound and beneath the conjunctival flap, Maggiore's conclusions confirm those of most recent investi-

gators. One observation of special interest was made, namely that the action of iris tissue in blocking scar formation in the scleral wound was more complete when the iris tissue was rich in pigment and less complete when the iris was poorly supplied with pigment.

While it is unfortunately true that the relief obtained from any type of filtration operation for simple glaucoma may occasionally prove evanescent, yet either the operation of Lagrange or that of Elliot, in combination with iridectomy, or the type of operation associated with the names of Holth and Borthen, if performed early and under proper conditions, offers a distinctly hopeful prognosis. But it is apparently desirable that a not inconsiderable amount of iris tissue should remain in the lips of the wound, a purpose which may be accomplished either by a somewhat ragged iridectomy, or more positively by doing an iridencleisis or an iridotasis, or by combining Lagrange's or Elliot's method of sclerectomy with treatment of the iris as in an iridencleisis; while in each of these variations it is particularly advisable to make a conjunctival flap which in the first place is sufficiently ample to maintain relationship between the incarcerated uveal tissue and a large subconjunctival space, and which in the second place is not too thin where it lies in contact with the prolapsed iris.

W. H. Crisp.

ROENTGEN THERAPY FOR BLEPHARITIS

Much still remains to be learned with regard to the benefits that may be derived from various forms of radiant energy in the treatment of disease. Sun therapy, natural and artificial, has produced remarkable results as a general constructive factor, and, probably because of this general tonic effect, it has been successfully applied in the treatment of many local disorders, including a large variety of skin infections and dyscrasias. A great deal has been claimed for infrared radiation, although many physicians believe that heat in its more familiar modes is just as efficacious as when applied by radiation.

In a general way the profound influence of the x-ray and of radium upon the cells of the body is well known, but both of these sources of radiation are known to have powerful destructive effects, and the fact that their employment is not free from danger has undoubtedly interfered with more general resort to them for therapeutic purposes.

As regards the eye, fear of harm to the refractive media and even to the retina has interfered with the use of the x-ray or radium in a number of diseased conditions of the anterior segment. The treatment of cancerous growths, or the removal of misplaced eyelashes, with radium is an example of selective destruction. For miscellaneous local conditions the practicability of radium application is not so great as in the case of the x-ray, and the risks are less readily controlled.

But from time to time important successes are reported in the use of x-rays for disorders in which stimulation is necessary. In some conditions there is a marked tendency to the formation of new bloodvessels which themselves may prove a source of annoyance rather than of benefit, and it is well to remember that x-radiation has a recognized power of destruction of young bloodvessels. With this in view, x-rays have been tried, with apparent benefit, in an attempt to shorten the period of excessive vascularization after lime burns.

The x-ray is distinctly one of the therapeutic agents to be considered for the stimulation of sluggish corneal ulcers, and the application of a fraction of an erythema dose often affords much relief from pain in such conditions.

Among the most obstinate disorders with which the ophthalmic physician has to deal is chronic blepharitis. Some cases of blepharitis show a decided tendency to recover when eyestrain is relieved by proper glasses. But there

are many cases of blepharitis in which refractive errors are at least not the only causative factor and in which the obstinacy of the condition is mostly comparable with that of the various types of eczema. In these cases medication seems to afford relatively little relief, or such relief as is obtained proves temporary in character.

Luzsa (Klinische Monatsblätter für Augenheilkunde, 1930, volume 84, January, page 76) found ultraviolet radiation ineffective in the treatment of blepharitis, and he attributes this failure to the fact that ultraviolet rays have very little power of penetration. On the other hand, he has had extremely gratifying results from the use of x-rays. Of thirty-one cases so treated, fourteen were completely cured and nine showed a striking improvement. A number of the remaining eight cases failed to return to the clinic for repetition of the treatment.

The patients chosen for roentgen treatment were those who had proved most resistant to other forms of therapy over a long period of time. During the course of radiation all other treatment was discontinued.

The effective dose of x-ray was found to be that which produced an actual erythema of the lids. Patients who developed an erythema got well or at least improved, while (with one exception, a very recent cast of blepharitis) those who showed no erythema were not helped. For patients in whom a satisfactory erythema was not produced by the first two doses, a cumulative effect was sought, and if necessary the amount of the individual dose was increased. The adequate dose varied in different patients. If the first dose was sufficient to cause an erythema, two treatments at an interval of one week were practically always all that was required.

The first experiments were made with from ten to fifteen percent of the standard skin-erythema dose, but this produced no result. In different subjects the adequate dose was found to vary between twenty and thirty percent of the standard erythema dose. On twenty-two patients a three millimeter aluminum filter was used, and on the other nine the aluminum filter employed was two millimeters thick. The discharge is technically stated as produced with a tension of 109 kilovolts at an intensity of four miliamperes and a focal distance of twenty-three centimeters for an exposure of twenty minutes through the three millimeter filter, or of sixteen minutes through the two millimeter filter. The eyeball was protected by a layer of glass two millimeters thick, containing fifty percent of lead. *W. H. Crisp.*

BOOK NOTICES

Stereoskopischer Atlas der äusseren Erkrankungen des Auges nach farbigen Photographien (Stereoscopic atlas of external diseases of the eye from colored photographs). By Karl Wessely, professor in München. Section 1, plates 1-10. In cardboard case, price 12 marks. Published by J. F. Bergmann, Munich, 1930.

This is the first of a projected series of six such atlases, each to contain ten colored plates of external diseases of the eye. Each plate is a three-color reproduction of an AGFA stereophotograph and is designed to be observed through an ordinary stereoscope. The use of a high-powered magnifying stereoscope brings out the grain and destroys much of the illusion. This first series illustrates pigmented nevus of the lower lid, circumscribed melanosis of the conjunctiva, recent lime burn, congenital coloboma of the iris, symblepharon of the lower lid, gonorrheal conjunctivitis, iris bombé, sarcoma of the orbit, herpes zoster ophthalmicus, and a far advanced lid carcinoma. Printed on the back of each plate is a description of the case in German, French, and English, the English translations having been made by Dr. Perkins of New York.

In the main, the photographs are excellent and show good plasticity, not exaggerated. The details are such that to the trained eye the diagnosis is possible without reference to the text. The one possible exception to this is the picture of iris bombé. In some instances the grain of the photographic plate is somewhat too manifest, but this detracts only slightly from the value. On the whole, this first of the series promises well for the future and, when the entire sixty plates are available, there will be at hand an atlas of inestimable value for teaching purposes.

Harry S. Gradle.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, and parasites
18. Hygiene, sociology, education and history

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8. GLAUCOMA AND OCULAR TENSION

Vogt, Alfred. **New cases of capsular glaucoma.** Klin. M. f. Augenh., 1930, v. 84, Jan., pp. 1-2. (4 ill.)

Vogt gives the first histological description of senile exfoliation of the anterior capsule, with illustrations. These show the exfoliated parts of the capsular lamella lying free in front of the capsule, as ascertained with the slit-lamp before death. The clinical aspect is typical. From the sixtieth to the eightieth year of age, seldom earlier, a bluish-white felt is seen on the pupillary border, consisting of pieces of a fine exfoliating membrane, which has been detached by the pupillary movements. The detritus gets into the aqueous and by obstructing the efferent paths finally produces chronic glaucoma in the majority of cases. Out of 150 cases of chronic glaucoma observed at Vogt's clinic at Zurich 8.6 percent were capsular glaucoma. Out of all cases of capsular exfoliation 34 had glaucoma, that is 75 percent. It seems that in this type of chronic glaucoma the operative prognosis is not so good as in ordinary glaucoma.

C. Zimmermann.

Vom Hofe, K. **Hypertension and compensatory hypotension.** Arch. f. Augenh., 1929, v. 102, Dec., p. 315.

With the injection of small amounts of normal salt solution in the vitreous of a rabbit's eye, the resultant hypertension is followed by a decided hypotension for a varying period. To a certain degree these changes are also present in the untreated eye. This is explained in part by a change in tissue elasticity. *Frederick C. Cordes.*

9. CRYSTALLINE LENS

Andersen, C. L. **Blood-sugar determination in patients with senile cortical cataract.** Acta Ophth., 1929, v. 7, p. 339.

The article contains a review of the literature, and a report of the author's findings illustrated with charts and tables. In a study of the comparative frequency of cataracts among diabetics and nondiabetics, the author found practically no difference; only diabetics between fifty-one and sixty years of age showed a slightly greater frequency of lenticular opacities than nondiabetics. In still older patients there was greater frequency of cataracts in nondiabetics. These findings are surprising, because it is generally believed that diabetes had a deleterious influence on the lens. It has occurred to the author that the factor responsible for cataract in diabetics may operate independently of glycosuria and may be associated with latent diabetes or hyperglycemia. With this idea in mind the author examined fifty patients with progressive

cataracts, forty-two patients with incipient cataracts, and twenty-nine patients with clear lenses, for the blood-sugar content and sugar tolerance. The blood-sugar content was taken according to the method of Hagedorn and Norman Jensen. The author found no hyperglycemia in cataract patients. The sugar tolerance was tested by feeding aglycosuric patients, after a twelve to fifteen hour fast, fifty grams of fresh wheat bread. The blood-sugar was tested previously and at short intervals after the test meal. There was nothing of pathologic significance in the findings on sugar tolerance of cataract patients. Nor was the senile curve, which is higher and longer, encountered with greater frequency in cataract patients than in patients of the same age whose lenses were clear. However, the average sugar tolerance curve of cataract patients is of a somewhat different form; it has a lower starting point and a summit extending further to the right, and shows a higher blood content one and a half hours after the test meal.

Ray K. Daily.

Boente, F. **Lime deposits in the lens.** Arch. f. Augenh., 1929, v. 102, Dec., p. 261.

Boente describes lime deposits in the lens, especially as seen with the slit-lamp. He reports one case in which the lime deposits were in the form of calcium carbonate. The patient, a man of sixty years, had in the lens of one eye twelve pebblelike lime deposits measuring about 0.5 to 0.7 mm. The lens was removed and the deposits analyzed. They were structureless and resembled small pebbles. Analysis showed them to be composed of pure calcium carbonate without phosphorus or magnesium. This is the first time deposits of this type have been recorded. *Frederick C. Cordes.*

Busacca, Archimede. **Anatomical and clinical observations on the zonular lamella and its detachment from the lens.** Klin. M. f. Augenh., 1929, v. 83, Dec., pp. 737-757. (12 ill., 1 col. pl.)

From his anatomical studies and clinical observations, with the detailed reports of four cases, Busacca reaches the following conclusions: The zonular lamella is a formation arising from the fringing of the zonular bundles which cover the equatorial and periequatorial regions of the lens. Their main portion is inserted in the pericapsular membrane, which covers the whole lens. The membrane becomes thicker and serrated in the equatorial and periequatorial regions. Some zonular bundles perforate the pericapsular membrane and penetrate into the superficial and intermediate strata of the lens capsule proper.

The zonular lamella may become detached from the pericapsular membrane, which remains adherent to the lens, as anatomically shown by the author. Probably degenerations at the ends of the zonular bundles are the chief pathogenetic reason for this kind of detachment, which is typical in subluxations of the lens. There may also be cases in which the pericapsular membrane with the zonular lamella is separated from the lens, e.g. by traumatism.

The formations on the anterior surface of the lens within the pupillary area, described by some authors as detachment of the zonular lamella, have nothing to do with the zonular lamella but must be interpreted as deposits or as rupture and stretching of the pericapsular membrane and the superficial strata of the capsule.

C. Zimmermann.

Klare, D. **Clinical observations of the operative treatment of cataract in children.** Arch. f. Augenh., 1929, v. 102, Dec., p. 165.

A review of the clinical material of the Jena University eye clinic over a period of ten years shows that the improvement of vision by surgery in congenital and early childhood cataract, exclusive of traumatic cataracts, is greater than most authors place it. In seventy-four percent of the cases, operation improved vision to such an ex-

tent that the patients were able to attend the regular school. Without operation, fifty-seven percent would have been unable to attend school.

In only two eyes out of the one hundred and six operated upon were there severe complications. Operation should be carried out early and the correction given as soon as possible; in some cases the glasses were given at two years of age. It is the duty of the oculist to observe these children regularly, so that the correct glasses are worn, and to watch for possible secondary cataract, so that the child may have the full benefit of the cataract operation. *Frederick C. Cordes.*

Levinsohn, G. **Needling of secondary cataract.** Arch. f. Augenh., 1929, v. 102, Dec., p. 387.

Levinsohn gives his qualifications for an instrument to be used in cutting through secondary cataracts. It must be a light, simply constructed knife, that will enter the eye without loss of aqueous. It must attack the secondary membrane vertically and must also be so constructed that it can be used even in a deep-set eye. The author describes his knife, which he feels answers all these qualifications.

Frederick C. Cordes.

Löwenstein, A., and Haurowitz, Felix. **Experimental observations on the behavior of the lenses of cattle during variations in the surrounding medium.** Graefe's Arch., 1929, v. 122, p. 654.

Hypertonic salt solutions produce the well known salt opacities in the lens of mature cattle, perinuclear opacity in younger cattle, and nuclear opacity in young calves. These forms may not be identified with clinically recognized opacities, since they retrogress at 37 degrees.

We find the same differences in cataract from cold; nuclear changes in the young, perinuclear in older, and delicately extensive opacity in mature animals. The basis of the opacity from salt and from cold is evidently the insoluble proteins of the lens-fibers and not the soluble "crystallin". In artificial lesions of lenses there diffuses into the surrounding salt solution this very soluble albumen (crystallin).

The experimentally produced acid cataract occurring in a weekly acid reaction (P_h 5-6) rests upon the precipitation of the alpha crystallin.

Experimental salt opacity, cold opacity, and acid opacity are independent of lesions of the capsule. The authors were not able to demonstrate a protective action of the capsule, even less a precipitating action of the normal (artificial) aqueous upon the lens albumen. *H. D. Lamb.*

Safar, Karl. **Extraction of senile cataract in the capsule.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 147.

The author reports on the fifty-two cataract operations performed by him at the Meller clinic during the first year in which he used the intracapsular method. A careful general examination precedes the operation. If blood pressure is high a copious bleeding is instituted. If there is suspicion of infection of the tear sac, this structure is extirpated and the operation is postponed. If the conjunctiva cannot be made culture-negative by swabbing and irrigation, the region of incision is touched with five percent tincture of iodine just before and after the operation. The pupil is dilated with homatropin. Akinesia is produced by novocaine injection deep into the orbit between muscle and periosteum. One-half c.c. of novocaine solution with adrenalin is also injected behind the ball in order to reduce the tension and to decrease the tendency to vitreous prolapse. A bridle suture is applied just behind the insertion of the superior rectus. As part of the limbal incision a large conjunctival flap is produced which can be tied by means of a suture passed through the flap before extraction of the lens. After a basal iridectomy the lens is grasped by means of a blunt capsule forceps. Counter pressure with a muscle hook helps to

break the zonular fiber and the lens is pulled forth without ever releasing the grasp of the capsule forceps. One per cent eserin ointment is placed in the eye before the bandage is applied. It is inadvisable to attempt intracapsular extraction with young patients. Unripe cataract offers the best chance of success.

When successful the operation is practically ideal. Vitreous loss and prolapse of iris occur no more frequently than in other methods of operation. It is more difficult to perform and requires skillful assistance. If the capsule tears before the operation is complete it is decidedly more difficult to complete the operation.

(See also editorial, American Journal of Ophthalmology, March, 1930, page 241.) *F. H. Haessler.*

Salzer, Fritz. **A hitherto unknown malformation of the human lens (lens without nucleus).** Klin. M. f. Augenh., 1930, v. 84, Jan., pp. 52-56. (2 ill.)

A woman aged forty-five years presented complete absence of the central part of the right lens, except thin layers of the anterior and posterior cortices, with apparently intact anterior and posterior capsules. This explained the peculiar optical phenomena in the case; the direct ophthalmoscopic image of the fundus through the central parts being like that in an eye operated upon for cataract, and good vision being had with a spherical cataract lens. The most natural explanation was the assumption of a primary malformation of the lens from lack of the embryonic foundation for the nucleus, while the peripheral portions developed regularly. Most likely the disorder was due to liquefaction of the nucleus and absorption in an early embryonic stage, with spreading of cataract formation to the preserved parts of the lens. *C. Zimmermann.*

10. RETINA AND VITREOUS

Balas, G. **Contributions to the histology and pathogenesis of thrombosis of the central retinal vein.** Arch. f. Augenh., 1929, v. 102, Dec., p. 339.

Balas gives the histological findings in four cases of thrombosis of the central retinal vein. Thrombosis of the central vein may be accompanied by occlusion of the central artery, although this usually occurs some time later. The media of the vein is thinner than that of the artery. Because of this fact, the endothelium of the vein reacts more readily and more rapidly to the abnormal blood flow and to the compression of the surrounding connective tissue. This consists of an endothelial and subendothelial growth, with either a primary or a secondary thrombosis which later organizes. Naturally, there may also be an arteriosclerosis present which complicates the histological picture. *Frederick C. Cordes.*

Barbieri, Antonio. **Familial hemeralopia or nocturnal blindness in choriocapillary degeneration.** Arch. de Oft. de Buenos Aires, 1929, v. 4, Nov., p. 669.

The author had an opportunity to study four cases of this condition in children of the same family, of Polish extraction. On the maternal side there was a history of defective vision of unknown nature. The parents were in good health, were not related by blood, and their vision was normal.

Attention was first called to the children by their great difficulty in going about at night. As they had to grope their way constantly, they were always anxious to go to bed early. Each case is reviewed in detail, with a discussion of the physiology and biochemistry of the choroid and retina, and their relation to the elaboration of the visual purple.

Pigmentary degeneration of the retina is primarily a sclerosis, with later atrophy of the choriocapillary layer, extending to the retinal vessels. Coincidentally there is an infiltration of pigment granules as far as the internal limiting layer with late atrophy of the rods and cones. This begins in the periphery and extends toward the macula, the loss of the visual field being coincident with its advance.

The children showed marked contraction of the fields of both eyes, as demonstrated by the pupillary reflex to light. There were no lesions in the fundi such as are characteristic of pigmentary degeneration. Such symptoms without the typical fundus picture have been termed "retinitis pigmentosa sine pigmento." The cause is apparently an insufficiency of the retinal pigment as normally elaborated, related to the atrophy of the choriocapillary vessels. *A. G. Wilde.*

Berens, Conrad. **Diagnosis of elevation of intracranial pressure without papillary stasis by the study of retinal arterial pressure.** Ann. d'Ocul., 1929, v. 166, Nov., pp. 853-864.

The author has done a large amount of work on this subject, using the method of Bailliart. In his conclusions he notes that the diastolic arterial pressure is considerably higher when the patient changes from a standing to a lying position. He thinks the method is of diagnostic value in cases of suspected brain tumor where there is no choking of the disc nor disease of the retinal arteries, because in these cases lumbar puncture is dangerous on account of the possibility of fatal pressure on the medulla from increased intracranial tension. *Lawrence T. Post.*

Deutschmann, R. **Ignipuncture in retinal detachment.** Münch. med. Woch., 1930, v. 77, Jan. 17, p. 102.

The ignipuncture operation was first suggested and practiced by de Wecker and Abadie in 1881 and 1882, then abandoned until it was taken up again by the author, who reported his results in 1895 and thereafter. The author gave it up as less satisfactory than other procedures. His technique however consisted in puncturing the point of maximum accumulation of fluid, after allowing it to settle to its definitive position, and without any reference to the presence or position of the retinal tear. He does not agree with Gonin and his followers as to the conditio sine qua non of retinal tear in the production of detachment, but believes, as he has elsewhere pointed out, that the tear is nature's method of relieving the overstretched retina. This purpose being accomplished he agrees that it should be closed. He has attempted the operation many times in the course of the past twenty-five years, but the frequently resulting bands and retinal puckering afterward led him to desist. While Gonin is entitled to credit for his work and exceptional results, the priority belongs to the author, who would limit the procedure to specially selected cases, i.e. where the tear is recent, accessible, and of favorable size.
M. Davidson.

Fortin, E. P. **Notes on retinal detachment.** Arch. de Oft. de Buenos Aires, 1929, v. 4, Oct., p. 652.

The author bases his views on a series of sections from animal and human sources, which he has studied with especial care under high magnification. Various theses are stated and discussed separately. (1) The retina is only loosely attached to the pigment epithelium. (2) Normally the extremities of the cones reach the choroid. While the usual description states the cones are shorter than the rods and do not reach the pigment epithelium, this is an error. The two are of the same length, but as the extremities of the cones are so fragile they break readily, and hence in the usual section are made to appear shorter. It is certain that the macular region consists only of fine cones, and if their extremities did not reach the choroid they would mat together and produce a physiological separation of the retina at that point. The terminations of the rods and cones are but one micron in diameter, and effect the only connection between choroid and retina. (3) The external limiting layer is a definite and highly resistant membrane. Although the usual belief is otherwise, in the central portions of the retina the author has never been able to find any of the supporting fibers of Müller reaching the external limiting membrane. (4) The external half of the retina is

entirely avascular. The human retina is divisible into two halves of about equal thickness. The internal or neurocerebral layer is nourished by the retinal artery, the external or neuroepithelial lacks both capillaries and blood cells. This membrane is nourished by osmosis, and excess of this secretion will result in a separated retina. (5) If after separation these two membranes come into apposition the fluid should be capable of affording nourishment and functional recovery should be possible. *A. G. Wilde.*

Keeler, E. C. **Hereditary blindness in the house mouse.** Bulletin no. 3, Howe Laboratory of Ophthalmology, 1930, Jan. 1.

This paper is based upon experiments reported to the American Eugenics Society. The mice were trained in an apparatus in which the choice depended on vision. Repetition of tests confirmed the conclusion that certain mice were totally insensitive to visual stimuli. Histological studies showed the optic nerves were normal, and the number of nerve fibers the same as in seeing eyes. The vascularization of the retina was normal, and the pigment epithelium, the ganglion cells, and the internal nuclear layer were normal. But the external nuclei were entirely wanting or very few; and when present they developed neither rods nor fibers. The defect is named "rodless retina."

Visual purple, which may be readily demonstrated in the retina of the dark-adapted normal albino mouse, was absent in the rodless eyes. The eye of the normal mouse is relatively undifferentiated at birth, and the rodless eye cannot be differentiated from the normal except by the number of nuclei. Fewer mitoses are occurring in the rodless eye. The differentiation of the rodless eyes ceases at seven days. In the normal mouse eye the rods are well differentiated at the thirteenth day, but have not attained their complete growth. In man there are more than two score of eye defects, including varieties of cataract, which run in families. "Ophthalmology is a high road upon which medicine is destined to meet and learn to know heredity."

Edward Jackson.

Lobeck, Erich. **The swelling of the vitreous from change in its reaction.** Graefe's Arch., 1929. v. 122, p. 668.

The results of the author's experiments with the vitreous of swine showed that with the vitreous held at body temperature no increase occurred in its original volume when a change in its reaction was made, in other words there was no demonstrable swelling of the vitreous under these conditions.

H. D. Lamb.

Marquez, J. G. **The retinal pulse in intracranial lesions.** Rev. Cubana de Oft. y Oto-Rino-Laring., 1930, v. 2, Jan., p. 9.

This article deals with the uses of the ophthalmodynamometer devised by Baillart for determining the intraocular arterial tension. Several cases are cited in which the instrument was used as an aid in diagnosis of intracranial lesions.

A. G. Wilde.

Meller, J. **On the activity of the epithelium of the ciliary body in absorbing vitreous hemorrhages.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 113.

Histological studies on an eye in which there had been hemorrhage into the vitreous show that the epithelium of the ciliary body is active in absorbing the blood, and that it is probably the main factor in clearing the vitreous.

F. H. Haessler.

Stallard, H. B. **Some observations on the causes and treatment of simple detachment of the retina.** Brit. Jour. Ophth., 1930, v. 14, Jan., p. 1.

The author discusses the etiology and analyzes 100 case reports secured from English, American, and continental ophthalmic surgeons. The greatest percentages of cases occurred between the ages of fifty and sixty years. Males predominated, sudden onset was more

frequent, myopia was a large factor, and the lower half of the retina was more frequently affected. Treatment is discussed under the headings of prophylactic, conservative, and operative. Under the last the procedures proposed by many surgeons are discussed. An accompanying table shows seventeen percent recovery by conservative treatment, 17.5 percent by scleral puncture. The summary recommends early treatment, conservative methods for two or three weeks, scleral puncture as affording the best results. Patients should avoid strenuous exercise. Treatment of traumatic cases is more favorable, in myopes less favorable, in diseased conditions unfavorable. *D. F. Harbridge.*

Terrien, F., and Renard. **Observations upon the type of retinitis designated as "azotemic".** Arch. d'Opht., 1929, Oct., v. 46, p. 594.

The various theories as to the cause of albuminuric retinitis are reviewed and the suggestion is made that the term renal retinitis be used to designate this condition. Four case reports are cited to show that the retinitis may be present without increased blood urea, and that hypertension, hypercholesterinemia, and increased intracranial pressure may accompany renal retinitis. The conclusion is reached that renal retinitis seems to be produced by the association of many factors which also affect the body in general and cause in particular hypertension and modification of the blood serum, These factors produce in the eye vascular lesions which in turn produce exudate. In general the kidney lesions parallel the ocular lesions, so that the prognostic value of renal retinitis is geat. One may expect a severe renal disturbance within a short period if one discovers renal retinitis in a person who is at the time apparently in good health.

M. F. Weymann.

Trantas. **Concerning the treatment of hemeralopia and keratomalacia by the feeding of liver.** Arch. d'Opht., 1929, Sept., v. 46, p. 551.

Reports of several cases are given where xerosis and beginning keratomalacia with hemeralopia were cured in from two to seven days by the feeding of boiled liver. Cures reported by the use of cod-liver oil show a period of treatment of from two to twelve weeks, while seven days was the longest period required by feeding liver. For nursing infants the writer suggests feeding the mother liver, baths in water in which liver has been boiled, and feeding the infant twenty-five grams of liver a day. He considers hemeralopia due to a hepatic deficiency disease which interferes with the function of the visual purple. By feeding liver this deficient element is supplied and the dysfunction is corrected. The writer has fed liver to patients affected for many years with retinitis pigmentosa, with the hope of arresting although not curing the disease.

M. F. Weymann.

Waddy, G. **Sequels of toxemias of pregnancy.** Med. Jour. Australia, December 21, 1929, p. 883.

The two important sequels to toxemia of pregnancy are defective vision and pathological condition, chiefly of the retina and optic nerve. They are associated with eclampsia and preexisting nephritis. With eclampsia blurred vision and a central island scotoma are the usual ocular symptoms. These may last a few minutes to days, and the severest form is complete amaurosis or blindness. Examination shows no pathological change in the fundus.

A woman with old nephritis, becoming pregnant, may show albuminuric retinitis, some optic neuritis, scattered retinal hemorrhages, and fluffy patches, with or without some defects of vision. The longer the pregnancy is continued the worse are the ocular lesions likely to become, and the poorer the prognosis for recovery of vision. Retinitis may cause no impairment of vision and may only be revealed by ophthalmoscopic examination, and true retinitis of pregnancy may occur without renal symptoms. Waddy recalls three cases of total blindness from recurrent retinitis

due to child bearing, the end result being complete optic atrophy. In optic atrophy consecutive to post-partem hemorrhage vision is at first lost; but some recovery in one or both eyes generally follows. *Edward Jackson.*

Wegner, W. **New conclusions concerning the pulsatory variations in the human eye and its tunics.** Arch. f. Augenh., 1929, v. 102, Dec., p. 1.

Wegner used the same apparatus in this work that he used in his experiments on retinal ischemia. With this, he was able to produce a uniform extraocular pressure of varying degree. The curves recorded showed the variations in pressure in normal eyes without blood vessel changes. The systolic blood pressure in the ophthalmic artery was found to be about 90 mm. Hg. and the diastolic pressure approximately 55 to 60 mm. Hg. The author feels that he has an exact method of studying the intraocular blood system, and hopes that with this method some further light might be thrown on the subject of glaucoma. *Frederick C. Cordes.*

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Betsch, Alwin. **Bilateral atrophy of the optic nerve, of Leber's familial type, after traumatism.** Klin. M. f. Augenh., 1929, v. 83, Dec., pp. 814-818. (8 fields.)

A man aged twenty-eight years fell on October 27, 1928, from his motorcycle and was for one day unconscious in the hospital but could resume his work after one week. At the beginning of December he noticed impairment of vision in both eyes, and in January, 1929, he presented the symptoms of bilateral acute retrobulbar neuritis. After several weeks an absolute central scotoma developed in both eyes, and gradually extended to the periphery, with pallor of the temporal halves of the optic discs. The clinical picture corresponded with the protracted form of Leber's atrophy of the optic nerves. The only possibility of explanation was the assumption that the accident five weeks previous to onset of the subjective disturbances was (in a predisposed physique) the exciting cause of the affection of the optic nerves.

C. Zimmermann.

Car, A. **On rhinogenous retrobulbar neuritis.** Russkii Opht. Jour., 1929, Oct.-Nov., pp. 444-454.

After reviewing the literature on the relationship between retrobulbar neuritis and inflammations of the posterior nasal sinuses, the author relates his own experience in the treatment of twelve cases of retrobulbar neuritis. In all of them various operative procedures for the relief of sinus conditions were carried out, with uniformly good results as to the visual functions. The author stresses the fact that retrobulbar neuritis due to sinusitis is comparatively rare: his own twelve cases were observed in a total of 28,000 patients.

M. Beigelman.

Espildora Luque. **Acetylcholin in some ocular syndromes.** Arch. de Oft. de Buenos Aires, 1929, v. 4, Oct., p. 607.

Acetylcholin is described as a combination of acetic acid and cholin, occurring in ergot, and very poisonous. It and its commercial derivative arteriocholin were described in 1926 by French workers, who noted its vasodilator properties when used in either arteriospasm or the lesions of endarteritis obliterans. It has therefore been employed in obstructions of the central artery of the retina. Two cases are reported. The first is that of a woman aged twenty-eight years, who twelve years previously had suffered a post-scarlatinal nephritis. She showed an obstruction of the right paramacular artery, with vision decreased to 5/50, not correctable by lenses. There was an absolute scotoma in the superior external quadrant. The retina itself showed an ischemia adjacent to the macula. Arterial tension was 205/115.

Treatment was instituted with 100 mg. arteriocholin injections given on alternate days. The vision improved rapidly, although a transient dizziness was noticeable. Altogether 600 mg. were used; the vision then returned to

normal, and the retinal exudate disappeared. By the stereoscopic method no scotomata were found, and the blood pressure was reduced to 150/90.

The second case was in a thirty-five-year-old man, who twenty-four hours before had noticed a sudden diminution in the vision of the left eye. Similar attacks had occurred on five previous occasions, when they had gradually progressed to almost complete blindness in fifteen to twenty days and had required about two months to return to normal. Various consultants had pronounced these attacks to be retrobulbar neuritis, and antisyphilitic injections had always been employed in spite of a negative history and repeated negative Wassermanns.

Near the disc the arterial walls appeared surrounded by a thin white veil. The vision of the involved eye was 4/50, the other being normal. There was an absolute scotoma in the central field. Injections of 50 mg. of arteriocholin were begun immediately.

Three days later, 150 mg. of the medicament having been administered, evidences of the neuritis were subsiding rapidly. Vision had improved to 5/40, with only a relative scotoma for color. After six days' treatment, vision had improved to 5/20, with a remaining scotoma for green. Vision later returned to normal, with no scotoma.

The author does not recommend this drug in every form of retrobulbar neuritis, confining its use to those clearly of vascular origin and accompanied by evidences of hypertension. It is quite possible that retrobulbar neuritis of nasal origin is angiospastic, otherwise it would be impossible to explain the local action of cocaine and adrenalin, or the improvement following nasal hemorrhage after various rhinologic procedures. *A. G. Wilde.*

John, Isa. **On the frequency of tabetic optic atrophy and the usual methods of therapy.** Zeit. f. Augenh., 1929, v. 69, Nov., p. 283.

This is an elaborate statistical study from the Lindner clinic in Vienna. The author concludes that tabetic optic atrophy has not decreased materially in recent years. The course was usually more benign in females, and on the whole results were best in those cases which were treated only with potassium iodide and with none of the usual methods of therapy. No case of optic atrophy was observed in patients whose syphilis had been primarily treated with salvarsan and mercury. Since, however, atrophies have not decreased in number one must conclude that syphilis has become more frequent or that optic atrophy has increased relatively.

F. H. Haessler.

Velhagen, C. **Monocular hypoplasia of the optic nerve in an otherwise normal eye.** Arch. f. Augenh., 1929, v. 102, Dec., p. 382.

Velhagen reports a case of monocular hypoplasia in an eye that showed no other pathology. The nerve was approximately one-tenth the size of the disc of the other eye. The vision was limited to uncertain hand movement in the temporal half of the field.

Frederick C. Cordes.

Winther, K. **Optic nerve involvement in epidemic encephalitis,** Neurologisk Selskabs Forhandlinger, 1929, Feb., p. 27, in Hospitalstidende, 1929, Nov. 21.

Optic nerve changes in epidemic encephalitis are fairly common. It has been proved conclusively that choked disc occurs. When present, this appears during the acute stages of the encephalitis. After having disappeared it occasionally recurs. Optic atrophy is a common sequel. One case of unilateral choked disc has been observed. The diagnosis is most often confused with that of tumor of the brain. Four cases of choked disc are presented.

Optic neuritis is commoner and five cases with this complication are presented and reported. Optic neuritis may occur either in the interstitial or in the retobulbar form. The latter often presents great difficulties in differentiation from disseminated sclerosis. An

appeal is made to ophthalmologists for help in establishing further aids in the differential diagnosis.

D. L. Tilderquist.

12. VISUAL TRACTS AND CENTERS

Bourguet, J. **Puncture of the hypophysis according to the procedure of Simons and Hirschmann and according to that of the author.** Arch. d'Opht., 1929, v. 46 Nov., p. 655.

The reason for determining whether a lesion causing a chiasmal syndrome is suprasellar or in the hypophysis is that if it is in the latter position the nasal method of approach is to be preferred. The cranial puncture of Simons and Hirschmann for removing the cylinder of tissue for diagnostic purposes is criticized as being difficult, dangerous, and inexact. One is working blindly, and the frontal lobe is damaged by the maneuvers of the needle. The writer introduces a speculum under the mucous membrane of the nasal septum to the anterior wall of the sphenoid sinus. Through the opening of this cavity he sees under direct observation the sella turcica. He then removes the inferior osseous wall to expose the dura. The needle is introduced horizontally to perforate the dura, and when it is in the hypophysis a cylinder of tissue is aspirated. The danger of infection is considered negligible. *M. F. Weymann.*

Christensen, Viggo. **Concerning suprasellar tumors.** Arch. d'Opht., 1929, Oct., v. 46, p. 577.

From the standpoint of the clinician there does not exist a strict suprasellar syndrome. But there does exist a chiasmatic syndrome which affects the optic pathways and may be accompanied by alterations in the sella, organic changes due to pituitary dysfunction, and cytological changes in the spinal fluid. Two cases are reported, one of a hemorrhage affecting the chiasm without pituitary changes, and the other of acromegaly without visual field changes, to illustrate the difficulties of diagnosis. The primary symptom of simple chiasmatic involvement is lowered visual acuity, and accompanying this is usually the temporal field defect. Later one finds optic atrophy without papilledema except where fast growing tumors have increased the intracranial pressure. Central scotoma is not rare. A pleocytosis, especially with some large atypical cells, is not uncommon. This may be due to aseptic meningitis coming from the thinned partition between the meninges and the nasal pharynx. The importance of examination of the color fields is stressed, as they may be affected before one finds changes in the white field, even with minute objects. Less than one-fourth of sixty cases of tumor observed showed evidence of pituitary dysfunction. The greater proportion manifested themselves by simple chiasmatic symptoms.

M. F. Weymann.

Puiggari, M. I. **Visual disturbances due to severe hemorrhages.** Arch. de Oft. de Buenos Aires, 1929, v. 4, Oct., p. 612.

Two cases are reported. One was in a twenty-five year old woman who for several years had profuse menstruation. Four months previously, after an especially severe attack, she had became unconscious, and unable to recognize surroundings. A curetment controlled the flow somewhat, and vision improved slowly to normal. Later the same condition developed again.

The fundi showed bilateral secondary atrophy, the discs being white with indistinct outlines, and covered by a thin membrane. The superior temporal branch of the retinal artery was markedly reduced in caliber. Vision of the right eye was limited to large objects, and of the left to fingers at two meters. The visual field of the left eye was concentrically contracted.

The second was in a woman, thirty years old, who five days previously had had a severe postabortive hemorrhage, accompanied by marked diminution of vision. This progressively diminished until two months later she was only able to count fingers at a distance of

two meters with the right eye and four with the left. The fundi showed substantially the same as the previous case.

Prognosis is serious unless improvement is noted soon. In half the cases vision remains defective. In ten percent restitution of central vision is complete, but peripheral contractions remain. Of fourteen cases reported by Singer, vision was reestablished in only three.

Treatment. The head is to be placed low, and bodily defenses stimulated by protein therapy, and the exhibition of whatever tends to elevate arterial pressure. 200-500 c.c. physiological saline is used intravenously, with dionin and eserin locally, combined with massage of the globe, paracentesis, or iridectomy. In one case A. Fuchs obtained reestablishment of vision after the second transfusion of 250 c.c. of blood.

A. G. Wilde.

Raverdino, E. **Contributions to the study of craniopharyngeal tumors with suprasellar extrusion.** Riv. Oto-Neuro-Oft., 1929, v. 6, Sept.-Oct., pp. 389-404.

The author reports the cases of a man twenty-two years old affected by a tumor of the pharyngeal region with extensions to the middle cranial fossa, and the following eye symptoms: paralysis of both external recti, bilateral papilledema, and total blindness of the left eye. The vision of the right eye was: counting fingers at three feet, eccentrically, indirect vision only being present in the superior nasal quadrant of the visual field. According to radiography the sphenoidal sinuses and the sella were destroyed; instead of these structures a tumor mass was shown whose margins were evidently calcified. Following the emission of a semiliquid fluid from the mouth, the nose, and the right ear the pressure symptoms disappeared, and sixteen months later, when the patient was last seen, the vision of the right eye was nil, but the vision of the left eye was 6/10 and the conditions of the visual field had improved for form and colors. The left external rectus muscle was slightly paretic. The diagnosis of these tumors is based on the radiography and the ocular symptoms. The characteristic paralyses may be partial or complete, transitory, or permanent; their presence marks the period and the way of intracranial extension of the tumor, and demonstrates that the tumor is spreading along the base of the skull and through the sphenoidal sinuses. The absence of hypophyseal syndrome and of chiasmal symptomatology differentiates the craniopharyngeal from the hypophyseal tumors. (5 figures.)

Melchiore Lombardo.

Sgalitzer, M. **Experience with the x-ray treatment of hypophysis tumors.** Wiener med. Woch., 1929, v. 79, April 20, p. 566.

The best results are obtained in the benign eosinophilic adenomata, which react to small doses, while cystic tumors hardly respond to the treatment at all. From his twenty-five cases the author concludes that surgical intervention is indicated in those cases showing progressive loss of vision and lack of response to x-ray treatment.

M. Davidson.

13. EYEBALL AND ORBIT

Hagedoorn A. **Contributions to the embryology of the eye.** Arch. f. Augenh., 1929, v. 102 Dec., p. 33.

Hagedoorn studied the early embryology in amphibians, fish, reptiles, birds, bats, mammals, and man. The paper gives the detailed results of this work, which do not lend themselves to abstracting. Only the conclusions as to human eyes will be given here.

In small human embryos (18 mm.), there are already present a large number of mesodermal cells between the superficial epithelium on one side and the lens and optic cup on the other; and the endothelium with the perforated postendothelial tissue here contains many more cells than in tarsius. A little later (22 to 25 mm.) the endothelium is strongly developed, while the porous postendothelial tissue has to a great extent atrophied. Only a mem-

branous pupillary membrane remains. Between the endothelium and epithelium the cornea definita ectodermalis is now very distinct; in fact, more so than in tarsius, but thinner than in birds. Later the stroma cells, independent of the endothelium, grow into this layer to form the cornea definitiva mesodermalis. Soon the vascularized pupillary membrane arises.

The continuation of this work will appear in the next issue of the Archiv.

Frederick C. Cordes.

Renard, G. **The erysipeloid form of malignant staphylococcemia.** Arch. d'Opht., 1929 Sept., v. 46, p. 544.

A man forty years of age, with a history of caruncle of the nose seven days previously, was seen to be affected with a large violet plaque occupying the upper portion of the left side of the face. There was induration, swelling, and tenderness. The borders were indistinct and pustules and vesicles appeared irregularly in the lesion. There was unilateral exophthalmos. The temperature was 41° and the patient passed into coma and died five days later. Staphylococcus aureus was isolated from a blood culture. Autopsy showed thrombosis of the cavernous sinus. The purpose of the article is to call attention to the seriousness of this condition and to differentiate from true erysipelas. The author recommends trying the turpentine fixation abscess and vaccinotherapy.

M. F. Weymann.

Terson, A. **Abortion of orbital "prephlegmon."** Ann. d'Ocul., v. 166, 1929, Dec., No. 12, pp. 956-59.

A report of cure by the injection intramuscularly of "electrargol" causes the author to point out that he suggested this therapy in 1917 and again in 1924.

Lawrence T. Post.

Theisen, H. K. **Intracellular meningococcus infection in an eye, without meningitis.** Zeit. f. Augenh., 1929, v. 69, Nov., p. 320.

The author reports a case of panophthalmitis caused by intracellular meningococcus in which lumbar puncture demonstrated the absence of inflammation in the meninges. It is usually assumed that such panophthalmitis results either from an extension over the meninges or else hematogenously. Obviously only the second possibility can be considered here.

F. H. Haessler.

Verebely, T. **Contribution to pathology of orbit.** Wiener med. Woch., 1929, v. 79, Aug. 24, p. 1,111.

The author's own 244 cases of surgical exophthalmos are reviewed. They are divided into an orbital stenosis group, comprising those cases in which there has resulted a shrinkage of orbital space from external pressure on the orbital walls, and an orbital plerosis group, which includes all cases due to an increase of orbital contents. Thirty-six cases belonged to the first group. In the second group were 105 tumors. Some of the cases were rare, and their detailed histories and findings are given; and the pathology and evolution of dermoids are exhaustively treated.

M. Davidson.

Waardenburg, P. J. **A new instance of asymmetric arrest of development: congenital limitation of ocular movements without ptosis; hyperplasia of the semilunar fold; enophthalmos with narrowing of the palpebral fissure; lower position of the eye and of the palpebral fissure.** Klin. M. f. Augenh., 1929, v. 83, Dec., pp. 774-783. (7 ill.)

These anomalies occurred in the right eye of a young woman aged twenty-two years, and in the left eye of a man aged twenty-six years, not related to one another. This coincidence cannot be accidental and must be attributed to a developmental disturbance at a certain embryonic period, a problem which is discussed by the author in detail.

C. Zimmermann.

14. EYELIDS AND LACRIMAL APPARATUS

Avizonis, P. **Spontaneous dislocation of the lacrimal gland.** Russkii

Opht. Jour., 1929, Oct.-Nov., pp. 423-429.

Avizonis reports twenty cases of congenital misplacement of the lacrimal gland, observed within a period of five years. In the author's opinion, this is a frequent condition, and it is probably due to congenital or acquired insufficiency of the suspensory ligament of the lacrimal gland. *M. Beigelman.*

Campbell, G. **Treatment of chronic dacryocystitis.** Canadian Med. Jour., 1929, v. 2, p. 670.

To offset the impression gained from numerous reports that conditions of the lacrimal sac belong exclusively to the rhinologist, Campbell states that he is still doing total extirpation of the lacrimal sac by the external route. Prophylaxis should play a great part in the conditions that have an etiological factor in the nose. In the routine medical examination, lacrimation is likely to be passed over lightly. Prevention of these cases has not received sufficient attention, a thorough investigation is needed. Pressure over the sac and syringing may be effective early. When through gross pathological changes the sac ceases to function in the driving of the tears through their natural channel, the only rational method of dealing with the lesion is to remove the sac entirely by the external route.

This the author has done for more than twenty-five years by the original method of Meller, in patients from thirteen to seventy-four years of age, and he does not know of any undesirable results. He pays particular attention to curettage of the nasal duct. It is all done through a curved incision 12 mm. long, which has produced no visible scar. Among about 100 cases recently communicated with, only two had lacrimation present all the time, and in the one of these seen no pus was ever present, while the other patient suffered very much from constipation and "had neuritis and kidney trouble." Bacteriological findings before operation included xerosis bacilli, staphylococci, streptococci, and pneumococci, not always in pure culture. Postoperative tests were not always made; if the eyes were clean such tests did not seem necessary, and such tests when made had proved negative.

Edward Jackson.

Charamis, J. S. **Anomalous forms of the Marcus Gunn phenomenon.** Arch. d'Opht., 1929, v. 46, Nov., p. 663.

The classic form of the Marcus Gunn phenomenon consists in ptosis of the upper lid with elevation of the lid when the lower jaw is depressed. A review of the literature on the reported atypical cases is given with the addition of one original observation. An eighteen-year-old boy showed a ptosis of the right upper lid since birth. His brother and father also were said to have a ptosis. There was slight paresis of the left superior oblique, causing subvergent strabismus. Visual acuity was 2/10, due to amblyopia ex anopsia. In this patient, lifting of the upper lid occurred after depression of the lower jaw, contraction of the masseters, lateral movement of the jaw, thrusting forward of the chin, and retraction of the lips, and even slightly during swallowing motions. Thus elevation of the lid might be said to occur upon voluntary movement of muscles supplied by the fifth, seventh, and twelfth nerves. Photographs illustrating these phenomena accompany the article.

M. F. Weymann.

Duverger, R. **Technique to avoid hemorrhage during operations on the lacrimal sac.** Arch. d'Opht., 1929, v. 46, Nov., p. 676.

Regional anesthesia in extirpation of the sac is preferred because the tissues are not distorted by the anesthetic. One avoids severe hemorrhage by using the correct incision to miss the angular vein. The unpleasant oozing which is present can be controlled if one repeats three to four times the irrigation of the sac through the lower canaliculus with a solution of one part ten percent cocain, three parts 1 to 1,000 adrenalin, and two drops of one percent methy-

lene blue ten minutes before operation. This solution also stains the sac blue and makes it easier to be sure that one has removed all of the mucous membrane. It is, however, ineffective in old scarred sacs and tuberculous sacs, for here the action of the adrenalin is inhibited. *M. F. Weymann.*

Gala, A. **Plexiform neuroma and the sella turcica.** Bratislavske Lek. Listy, 1929, Dec., p. 1,236.

The author reviews the literature on unilateral elephantiasis of the lids and reports a case of the disease involving the left lids of a youth of nineteen years. Several operative procedures, the first at the age of four years, were futile. Histologically the removed tissue was of a typically neurofibromatous structure. There were no symptoms of hypophyseal disturbance, and a skiagram demonstrated an unusually small sella turcica. The literature contains reports of several cases in which unilateral elephantiasis of the lids was associated with enlargement of the hypophysis. The author cites his case to prove that this association is not constant. *Ray K. Daily.*

Gala, A. **Two congenital anomalies of the inner angles of the eyelids.** Bratislavske Lek. Listy, 1929, Dec., p. 1,248.

These anomalies are described and illustrated with photographs. One is a bilateral, symmetrical, horse-shoe shaped dilatation of the inner angles, from the center of which extends a folded fibrous cord over the conjunctiva toward the limbus; the angle was divided horizontally by a fold absorbing the plica semilunaris and the caruncle; the lacrimal apparatus was normal. The other is a bilateral, symmetrical avascular membrane, extending from the margins of the lids to their inner angles; this case had epiphora and an atresia of the left nasal duct.

Ray K. Daily.

Gerlach, Günther. **A mixed tumor of the eyebrow.** Klin. M. f. Augenh., 1929, v. 83, Dec., pp. 807-813. (3 ill.)

A man aged fifty-eight years had had for seven years a well encapsulated horny tumor of the left eyebrow of the size of a hazel nut, which was easily removed. Histologically it showed the aspect of a mixed tumor as typical for the salivary and lacrimal glands, but here of unusual location, and of benign character. *C. Zimmermann.*

Gutzeit, R. **New bone instruments for Toti's operation.** Klin. M. f. Augenh., 1930, v. 84, Jan., pp. 92-93. (4 ill.)

The instruments are described and illustrated. They are manufactured by H. Windler, Berlin. *C. Zimmermann.*

Luzsa, Andreas. **Roentgen therapy of blepharitis.** Klin. M. f. Augenh., 1930, v. 84, Jan., pp. 76-79.

Fourteen out of thirty-one patients were completely cured by roentgen rays, nine remarkably improved, while some others did not persist with the treatment Hence roentgen radiation seems to be preferable to medicinal applications, since most of the patients had been treated with these unsuccessfully. The dose must be individualized. The effect depends upon the erythema produced by the rays, which seems to restore the vitality of the damaged cells. *C. Zimmermann.*

Peters, A. **Remarks on rosacea of the eye.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 144.

The author points out that phlyctenular ophthalmia is not always a manifestation of a scrofulous diathesis, but that rosacea often causes the efflorescence of typical phlyctenules even in the first decade of life. Chalazia, too, are probably an accompaniment or complication of rosacea, particularly the small ones at the lid margin. He himself has rosacea and has developed sixteen tiny chalazia. He never had any evidence of seborrhea, hyperkeratosis, or hypersecretion of the meibomian glands—which Krückmann holds leads to chalazion formation.

F. H. Haessler.

Sabata, J. **Streptothrix infection of the lacrimal duct simulating trachoma.** Oft. Sbornik, 1929, v. 3, pp. 453-457.

Six months after treatment elsewhere, a female patient aged fifty-five years came to the clinic with symptoms in the left eye of recent papillary trachoma. Careful study revealed a streptothrix infection of the superior lacrimal duct. The ducts were irrigated with two percent sodium iodide solution, and potassium iodide was given internally. The patient also dropped sodium iodide solution into the eye three times a day. In one week the lids returned to normal. No recurrence was seen in fourteen months. (Bibliography.) *G. D. Theobald.*

Speciale-Cirincione. **The development of the lacrimal canal in man.** Ann. di Ottal., 1929, v. 57, June-July, p. 435.

Several authors have studied the development of the lacrimal canal, but their work has been confined to the rabbit, the pig or the sheep, with a few instances of human embryos in different stages of development. Errors may arise from this method, as the superior canal is absent in the rabbit, while in the pig on the other hand the inferior passage is lacking. In the carefully conducted work of many histologists a specimen has been taken at one or the other period of development, leaving hiatuses that have not been bridged. The author's unusually rich supply of material enabled him to take a series of twenty-eight embryos varying progressively from 4.5 mm. to 130 mm. and to study them in their order. At the time of his death it was his purpose to make this a part of a monograph on the embryology of the eye, of which he had made extensive studies. In this report he had given fifty-eight pages of accurately recorded observations with nine plates, each having from six to eight carefully executed figures. This work effectively complements that of Dr. Ida C. Mann, which evidently was done at about the same time. It cannot be summarized, but is a distinct addition to our knowledge of the histology and the development of this structure and incidentally of other associated tissues. The paper is supplemented by an excellent bibliography. *Park Lewis.*

Terson, A. **Later results after intrapalpebral injections of alcohol in spontaneous entropion of the lower lid.** Ann. d'Ocul., v. 166, 1929, Dec., pp. 951-956.

The three cases in which this procedure was done had been reported a year previously, and are now again reported upon. The first required reinjection after fourteen months, the second after ten months, while the last, which had needed a second injection after a few weeks, was now, after approximately one year, still doing well. The various methods of treatment of this trouble are reviewed. *Lawrence T. Post.*

Terson, A. **Treatment of spasmodic entropion, with notes on pathogenesis.** Arch. de Oft. Hisp.-Amer., 1929, v. 29, Jan., p. 7.

The author recommends for spastic or senile entropion, especially of the lower lid, an injection of alcohol eighty percent in the thickness of the lid, according to the method of Weekers. In one case of entropion after conjunctivitis in an old man with very relaxed skin, he first made an injection of novocain two percent, without adrenalin. Leaving the needle in place, and after waiting for seven minutes, he made a deep injection of one c.c. of alcohol eighty percent. The pain was almost none. The next day the patient complained of great tension in the lid, which was edematous. The result was very gratifying and the entropion disappeared entirely.

In another case in which the entropion had lasted for two years he made an injection of alcohol eighty percent with iodin 1 to 500. The reaction after this injection was a little more severe than with the alcohol alone. The result in this case was also excellent.

The author has also tried solutions of

sodium salicylate, mercury biniodide and hydrochloride of quinine and urea, which were never stronger than five percent.

Regarding the etiology of the disease, the author believes that the entropion is secondary to the virtual subluxation of the ciliary border of the lid and of the small inferior tarsus; the orbicularis maintaining the inverted lid in a bad position like an elastic string in a purse.

M. Uribe Troncoso.

Vujtech, Karel. **Bilateral gonorrheal conjunctivitis with bilateral dacryoadenitis.** Oft. Sbornik, 1929, v. 3, pp. 275-279. (See Section 5, Conjunctiva.)

Wright, R. E. **Webster's operation for entropion of the upper lid.** Indian Med. Gaz., 1929, v. 64, Oct., p. 549.

The author enthusiastically reports excellent results from the operation originally devised by Webster, but described by McRae in the British Journal of Ophthalmology, January, 1928. The essential feature is a mucous membrane transplant from the mouth. McRae recommended general anesthesia, but Wright prefers local, using two percent novocaine with adrenalin in lid and cheek. *Ralph W. Danielson.*

15. TUMORS

Böck, J. **Dictyoma retinæ.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 17.

The author describes morphological studies of an eyeball enucleated from a sixteen-year-old girl. The eye contained a tumor which had originated in the ciliary body, had infiltrated the iris and penetrated the sclera, and had proliferated subconjunctivally as well as inside the globe. It had all the characteristics which Fuchs described as typical of a tumor arising from the unpigmented cells of the ciliary body. Fibers which could be stained with a glia stain were demonstrable, a finding reported by only one other observer. Islands of cartilage were found in the tumor and the theoretical possibilities as to its origin are discussed. *F. H. Haessler.*

Collins. E. **Notes on the natural history of retinal neoplasms.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, p. 107.

The author propounds certain questions regarding retinal neoplasms, with especial emphasis on glioma. It may be well to quote verbatim the conclusions arrived at. The paper is well worth a careful reading in the original.

(1) At Moorfields Hospital during the past fifty-three years there is no evidence of any increase in the number of cases of retinal glioma.

(2) Retinal glioma is limited to the early years of life, because it arises from cells which become highly specialized and soon lose all capacity for reproduction; moreover, the retina is a tissue which contains no "mother cells".

(3) Cells in metastatic growths of retinal glioma sometimes become increased in size and altered in shape, due to a change in their environment—the chief alteration consisting in an increased vascular supply, the blood vessels in the primary growth being only terminal vessels.

(4) The uveal tract, when invaded by retinal glioma, reacts by the new formation of fibrous tissue, the contraction of which may cause the growth to shrink. When the ciliary body is invaded, the supply of intraocular nutrient fluid becomes cut off, and loss of this, together with contraction of the new-formed fibrous tissue, causes the eyeball to shrink.

(5) Retinal gliomata are growths of the neural epiblast, and in their mode of dissemination resemble carcinomata rather than sarcomata, spreading more frequently by centrifugal permeation along lymphatic spaces than as emboli in vascular channels. Hence secondary growths are more frequent in the vicinity of the eye than in the internal organs.

(6) The blood vessels of the retina, its only mesoblastic constituent, may undoubtedly be the seat of origin of capillary angiomata, possibly also of angiosarcomata. More evidence, however, regarding primary retinal malignant growths commencing after middle

life is required before this can be regarded as proved. *A. B. Bruner.*

Del Duca, M. **Histologic modification in a case of irradiated epibulbar epithelioma.** Saggi di Oftalmologia, 1928, v. 4, p. 384.

After giving a short résumé of the results obtained by numerous authors in cases of simple and recurrent limbal bulbar and intraocular epithelioma treated by x-rays, the writer cites a case of his own.

In a female aged seventy years a broad subconjunctival tumefaction extending from canthus to canthus and from limbus to the inferior fornix had existed four years, and had been excised when one year old, when of the size of a small lentil. A week later a recurrent growth was noted. After eighteen months the mass, then rather large, was excised a second time. A second recurrence started almost immediately after this operation.

A small section was excised, and histologically was found to be epithelioma of the epidermal type.

The first three irradiations were made at three-day intervals. On the seventh day after the last exposure, a marked improvement was observed in the condition of the eye, the tumor being diminished in size and the bulb generally less hyperemic. One month later a fourth treatment was administered, which was followed within three weeks by a short stationary interval and then by rapid progress of the growth, necessitating enucleation.

Whether this sudden change was due to decreased cancer cell sensitivity to x-rays or to the irritation of deeper unaffected tumor substance, the author is unable to state with definite proof.

From biopsy examinations this investigator finds that x-rays have a favorable action on limbal cancer. Neoplastic cell destruction occurs. Striking alterations occur in the chromatic nuclear substance. Vacuolization, fragmentation, and absorption of the nuclear substance was followed by destruction of the cell membrane, and gave the appearance of a syncytial mass. Some vessels became obliterated; others remained normal. Connective tissue, which at first became reduced, later proliferated and replaced the tumor cells. *F. M. Crage.*

Derer, Joseph. **Melanotic rhabdomyosarcoma of the orbit.** Bratislavske Lek. Listy, 1929, Dec., p. 1,240.

The author reports a case in a young man, seventeen years of age, who presented himself with the history of an exophthalmos in the right eye which he had noticed seven months earlier, and which was soon followed by a swelling visible through the lower lid on looking up. The patient had marked exophthalmos and dislocation of the eyeball upward; in the middle of the lower lid was a small, firm, somewhat rough growth, which became very prominent on looking up, and moved with the movement of the inferior rectus. The eyeball was normal; vision 6/6. Roentgenographically the cranium was normal. The growth was extirpated under local anesthesia through an opening at the lower temporal border of the orbit. It lay sagittally across the floor of the orbit, was connected with the inferior rectus muscle and was the size and shape of a date. Histologically it was a pigmented myosarcoma. The patient was discharged with normal vision, a healed wound, limited infraduction, but no diplopia. He returned seven weeks later with a recurrence; at the secondary operation, the growth was found so extensive that exenteration of the orbit, excision of the lower lid, and resection of a part of the zygoma and superior maxilla were necessary; the apex of the orbit was cauterized. Two and one-half years later there was no recurrence, and, considering the high mortality of these cases, the author considers this a very favorable result. *Ray K. Daily.*

Dusseldorp, M. **Adenocarcinoma of the glands of Moll.** Arch. de Oft. de Buenos Aires, 1929, v. 4, Nov., p. 695.

These glands are situated between

the lashes, and differ from other sudoriferous glands of the skin in that instead of being glomerular, they have the form of a greatly convoluted tube, surrounded by one or two layers of cylindrical epithelial cells that rest upon fusiform muscular elements, parallel to the long axis of the tube. They generally open directly on the free border of the lid, one being situated between each two lashes. Ten cases of adenoma have been published, generally between fifty-five and seventy years of age, but as early as at twenty-five years.

The case presented was in a woman of twenty-nine years, who seven years before had noticed a small tumor formation on the right upper lid margin, that was regarded as a chalazion and was removed with a curette. Within three months it had returned to the same size and form, and it continued to grow slowly. The tumor measured 8 mm. horizontally and 6 mm. vertically, and was situated in the outer third of the lid. It was hard, smooth, well delimited and covered by apparently normal skin, containing several dilated vessels. The lid was thickened and somewhat ptosed, due to the weight, but there were no subjective symptoms referable to the growth. The tumor was removed in a cuneiform mass, and the operation was followed by radium. During the three years under observation, no return has occurred.

Histologically, the specimen was found well encapsulated, being embedded between the skin and the tarsus. In some portions the cubical and cylindrical cells enveloping the tubes had proliferated to form cords, that had invaded the conjunctival tissue and, uniting with similar adjacent structures, had spread widely and had taken on many structural modifications, including the formation of epithelial cell nests. The tubes themselves were dilated considerably in several places, their epithelial covering being here considerably thinned. In many parts the conjunctival supporting tissue had undergone hyaline degeneration. The article is well illustrated with cuts showing the tumor in place, and various sections under different powers of magnification. *A. G. Wilde.*

Dymshitz, I. A., and Avrutova, V. A. **Radium therapy in cancer of the orbito-palpebral area as employed by the eye hospital of the University of Kazan during the period 1917 to 1927.** Archiv Ophtalmologii (Russian), 1929, v. 6, pts. 2-3, pp. 367-378.

During the years 1917 to 1927 forty cases of palpebral and orbital cancer were subjected to radium treatment in the eye hospital of the University of Kazan. The following results are reported as to twenty-three of these cases: complete cure in eleven, improvement in four, no improvement in eight. The best results were obtained in circumscribed and superficial cancer of the lids and conjunctiva. Lesions of the internal orbital angle were most malignant. Recurrences in the course of radium therapy are little influenced by repeated radiation. A successful application of radium must be followed by a four year period of observation, after which the case may be considered completely cured. No serious complications were noticed in the use of radium. *M. N. Beigelman.*

Eberle, Hilde. **Two cases of tear-sac tumor.** Zeit. f. Augenh., 1929, v. 69, Nov., p. 339.

The clinical findings and histological studies from a case of papilloma of the tear sac and one of plasmocytoma are described. *F. H. Haessler.*

Gala, A. **Recurrent epibulbar melanosarcoma.** Bratislavske Lek. Listy. 1929, Dec., p. 1,261.

The author reports a case, under observation four years, of tumor on the left eyeball of a fifty-year-old man. The tumor originated from a small, pigmented nevus of twenty years' standing, situated on the bulbar conjunctiva, temporally from the limbus. When it suddenly began to enlarge and extend toward the limbus it was removed

surgically; within six years the patient returned four times, with recurrences of the tumor at the original site and metastatic foci at various points of the limbus and finally in the conjunctiva of the lower lid. Extirpation with the galvanocautery, electrocoagulation, and x-ray exposure were equally futile. The article is illustrated with three photographs of the tumor.

Ray K. Daily.

Heine. **Four cases of iris tumor.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 38.

The cases were: (1) A large iris gumma in which three phases of growth were distinguishable. (2) A large tuberculoma. (3) A typical iris tuberculosis. The clinical findings were published in the same journal, volume 65, 1928, by Mylius as a case of Böck's sarcoid. Anatomically only an old iridocyclitis and chorioretinitis with papilloretinitis, without specific manifestations, could be found. The questions implied by the term lupoid or sarcoid do not seem to Heine to be settled. (4) A typical tiny melanosarcoma as an accidental finding in a patient who presented himself for cataract extraction. It was removed by iridectomy. *F. H. Haessler.*

Klein, Nikolaus. **Rarer types of sarcoma of the choroid.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 489-497. (8 ill.)

A woman aged forty-four years had noticed for five months impairment of vision in her left eye, which was now 6/24. Two disc diameters toward the temporal side was a grayish-white nonfluctuating detachment of the retina, about seven diopters high, with a small dark area on its nasal portion. This dark area was diagnosed as sarcoma of the choroid, and the eye was enucleated. Illuminated from behind, the enucleated eyeball showed two separate black shadows, and microscopic examination revealed two tumors. Most likely the second tumor developed from sarcoma cells propagated from the first by the lymph current.

The second case was one of circumpapillary sarcoma in a man aged fifty years, whose vision had commenced to fail two weeks previously, and with correction was 6/12. Anatomical examination showed that the tumor had invaded the disc at its upper nasal margin.

C. Zimmermann.

Leser, Otokar. **Melanosarcoma of the ciliary body, with encroachment on the lens.** Ophth. Sbornik, 1929, v. 3, pp. 301-317.

The author describes minutely the appearance of the eye of a seventeen-year-old male, who had a sarcoma of the iris and ciliary body, which distorted the lens by pressure. The ciliary vessels from the six to the eight o'clock position were dilated, and the anterior chamber at that point was obliterated. The tumor could be readily seen with the ophthalmoscope. Every eleventh section was stained and studied. A careful description of the spindle-cell sarcoma is given. (3 illustrations. Bibliography.) *G. D. Theobald.*

Lopes d'Andrade. **Orbital sarcoma with normal development.** Ann. d'Ocul., v. 166, 1929, Dec., no. 12, pp. 959-68.

A case of such a tumor in a child is reported. From first symptoms to death was only three months. The diagnosis was leucosarcoma with origin at the upper nasal angle of the orbit. Several tumor sections and two photographs of the patient are given.

Lawrence T. Post

Löwenstein, Arnold. **The clinical course of intraocular tumors.** Klin. M. f. Augenh., 1930, v. 84, Jan., pp. 61-62.

Löwenstein suggests that a questionnaire be sent to all ophthalmologists to ascertain whether early enucleation of seeing eyes with intraocular tumors secures more definite cures or rarer metastasis than in those patients whose eyes have been removed later.

C. Zimmermann.

Magnasco, M. **Experimental tumors from inoculations into the eye of the**

rat. Saggi di Oftalmologia, 1928, v. 4, p. 1.

In his experiments on 110 rats of the same species, the author inoculated cellular suspensions or implanted minute fragments in various parts of the eye, including cornea, anterior chamber, iris, choroid, retina, sclera, vitreous chamber, optic nerve, and orbit. Fusiform-cell rat sarcoma was used.

Cold and advanced age delayed the growth of the tumor. Growth, however was unaffected in the rats when both eyes received tumor implants, as compared with the characteristics of growth in those where only one eye was treated.

In one case the cornea showed a remarkable receptivity and spread of the growth, but generally the corneal tissue was very resistant. Growth anteriorly and posteriorly, replacing the iris almost completely, resulted from inoculations into the anterior chamber. Inoculations into the vitreous showed very abundant growth spreading throughout the entire globe.

The retina resisted invasion, becoming detached but showing no replacement of its cellular constituents by neoplastic elements. The lens capsule was susceptible, and the lens itself showed cataractous changes. The choroid offered a fair field for growth, showing an increase in the number of blood vessels. The optic nerve showed no growth with any inoculation. The most fertile field for growth was the retrobulbar region, where all the inoculations were positive.

These experimental tumors differ from the human type in that they may regress and completely disappear. In man such malignant neoplasms are almost always progressive, with a tendency to destruction of the eye or to death of the individual by fatal metastases. *F. M. Crage.*

Moretti, Egisto. **Trauma in the genesis of sarcoma of the orbit.** Ann. di Ottal., 1929, v. 57, June-July, p. 515.

All of those malignant neoplasms formed from the connective tissue which originates in the mesenchyma are classified as sarcomata. Of 448 cases thirty-seven percent were under twenty years of age and only ten percent between sixty and eighty. Many authors confirm the opinion that sarcoma of the orbit has a predilection for the young while carcinoma more commonly attacks the aged. The question, considered as having both clinical and medicolegal importance, was as to the possible causative effect of the injury in producing the malignant growth. In the case discussed, that of a twelve-year-old lad, a swelling of the upper lid with slight ptosis was discovered ten days after a blow from a potato at the inner angle of the orbit. In two months the lids were swollen shut and an elastic tumor with some fluctuation was found. An incision released a small amount of pus, and biomicroscopy showed the presence of a round-cell sarcoma. The author cites many authorities in favor of his contention that the malignant tumor was not the result of the blow but the traumatism hastened the development of a blastoma already present. *Park Lewis.*

Mulock-Houwer, A. W. **On the relation between the so-called innocent melanomata and the malignant tumors of the choroid.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, p. 167.

The author opens anew the question of possible malignant degeneration of choroidal moles. He mentions contributions to this subject by several contemporaries, especially Mrs. Schappert-Kimmijser, and mentions several possible ways in which such tissue change may occur.

After presenting the pathological findings of a number of cases which tend to support this hypothesis, the paper is summarized as follows:

(1) According to Mrs. Schappert-Kimmijser, innocent melanomata of the uvea are more frequent in eyes with malignant melanomata than in eyes without them.

(2) In many malignant melanomata the distribution of the pigment suggests

the possibility that they have sprung from a deeply pigmented mother tissue.

A. B. Bruner.

Mura, F. **Epithelioma of the cornea.** Ann. d'Ocul., 1929, Nov., v. 166, pp. 864-870.

This is the report of a case in an eye which had been the seat of pannus and pterygium. A picture of the patient and two other photographs are included. *Lawrence T. Post.*

Nitsch, Maximilian. **Neurofibromatosis of the eye.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 117.

The title emphasizes the fact that the changes ascribed are not ocular changes accompanying generalized neurofibromatosis (Recklinghausen's disease) but that we are justified in speaking of a neurofibromatosis. The author describes two cases of this condition, and has found report of only one other in the literature. In one of these the changes were limited to the eye and in the two others there were tumor-like changes in the eye associated with manifestations of generalized neurofibromatosis. Nervous changes were noted in episclera, sclera, cornea, iris, ciliary body, and choroid. In the retina changes definitely characteristic of neurofibromatosis were not found.

F. H. Haessler.

Purtscher, Adolf. **An early symptom in incipient neoplasm of the choroid.** Zeit. f. Augenh., 1929, v. 69, Oct., p. 219.

The author reports in detail a case of choroidal neoplasm in which the peripheral necrosis produced inflammatory involvement of the sclera and of the contiguous extraocular muscle. This eventually healed, whereupon the tumor continued to grow internally and produced retinal detachment. The inflammation of the muscle was accompanied by diplopia, local redness, tactile tenderness, and swelling, which were the first signs of pathology in the eye.

F. H. Haessler.

Rodin, Frank H. **Angioma of the iris: first case to be reported with histologic examination.** Arch. of Ophth., 1929, v. 2, Dec., pp. 679-690.

A boy aged four years complained of pain and blindness of the right eye. A year previous to the examination, a point on the iris which bled at intervals had been noticed. Hemorrhages were frequently large and resulted in severe pain and loss of vision. The eye was removed because of pain and blindness.

Histologically, a large nodule of vessels was observed on the anterior surface of the iris. This mass of vessels was a vascular nevus, involving the iris and ciliary body and extending back to the lens. It resembled an angiosarcoma. Three histological sections are shown in accompanying plates.

Nine other cases have been reported in the literature, but the histological reports of only three of these showed them to have been angioma of the iris. The other cases were either of simple granuloma, granulation tissue following trauma, or spindle-cell sarcomas. In some no definite diagnosis could be made from the evidence presented.

M. H. Post.

Slavik, B. **Rare findings in eye tumors.** Oft. Sbornik, 1929, v. 3, pp. 281-287.

The author reports two cases of intraocular sarcoma. (1) An annular or ring sarcoma of the ciliary body. A male, aged seventy-four years, seven months previously, had been hit across the right eye by a cow's tail. Vision had been failing since. Glaucoma had developed, and, on account of a cloudy cornea and contracted pupil, intraocular examination could not be made. The patient died of metastatic sarcoma. The intraocular sarcoma was found post mortem. (2) A male aged sixty-two years had a tumor of the right orbit. The eyeball had been removed twenty-three years previously in Vienna. Through the kindness of Drs. Meller and Lindner, a slide of the eye was obtained. It showed a sarcoma of the choroid with extensions around the

vessels in the sclera. (5 Illustrations. Bibliography.) *G. D. Theobald.*

16. INJURIES

Chou, C. H. **Angiopathia retinæ traumatica** (O. Purtscher). National Med. Jour. of China, 1929, v. 15, Oct., p. 592.

This rare and interesting eye disease, as first described by O. Purtscher in 1910, usually follows a contusion of the head and skull. A few have been reported due to severe compression of the thorax and abdomen, and Chou here presents a case of that type. A male of fifty-one years was caught under an overturned motor bus, the compression lasting for about fifteen minutes. The patient had a typical picture of traumatic asphyxia, with discoloration of the face, the neck, and the upper part of the chest, associated with a fracture dislocation of the twelfth thoracic vertebra, and dislocation of the right shoulder joint. Beside the ecchymosis of lids and conjunctiva, there were numerous grayish-white opacities of various sizes and shapes in the region of the disc and macula in the right fundus. There was also a small hemorrhage. Only very slight changes were present in the left eye. The retinal changes as well as the skin discoloration disappeared in three weeks. (Two fundus plates and references.)

Ralph W. Danielson.

Chou, C. H. **Some rare injuries of the cornea.** National Med. Jour. of China, 1929, v. 15, Oct., p. 555.

Four rare cases of eye injury are reported, together with a review of the literature covering similar injuries of the eye. One case was due to the claw of a cat, two to plant cilia, and one to boiling lard. (Bibliography.)

Ralph W. Danielson.

Coppez, H. **Pseudo-foreign bodies of the eye.** Arch. d'Opht., 1929, v. 46, Aug., p. 449.

It is noted that patients often complain of foreign body in the eye when the sensation is caused by the beginning of an inflamation such as keratitis or iritis. In industrial work, if the worker allows several days to elapse between the time of injury and reporting to the physician, one may usually assume that the sensation of foreign body was due to the onset of inflammation and not to injury. Mention is made of mistaking pigment spots on the iris for foreign bodies. The value of slit-lamp examination in differentiating true foreign bodies from artefacts is stressed. Several cases are reported where difficulty was encountered in deciding whether a foreign body was present or not. *M. F. Weymann.*

Deggeller, Siegfried. **Purulent uveitis after injury by foreign body, with septicopyemic general affections.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 483-488.

A man aged forty-three years sustained from a piece of iron a perforating injury of his right sclera with prolapse of the choroid. The following day the piece of iron, weighing two grams, was extracted with the magnet. Two weeks later the patient returned. The eyeball was sunken, there were present chemosis, infiltration of the scleral wound, and a large hypopyon. Vision was nil. Seven days later a painful and swollen gland was discovered on the right clavicle, and in a few days arthritis of the right big toe had set in. The blood contained staphylococci. Evisceration had been refused. Fortunately the metastasis, undoubtedly due to staphylococci propagated from the eye through the circulation, disappeared. *C. Zimmermann.*

Geisler. **Roentgenographic localization of intraorbital foreign bodies.** Klin. M. f. Augenh., 1930, v. 84, Jan., pp. 87-91 (1 ill.)

A man aged forty-six years was shot in the right eye on October thirty-first, but did not come for examination until November fifth. There was a horizontal perforating wound of the temporal portion of the sclera. A for-

eign body could not be seen, on account of opacities of the vitreous and severe preretinal and retinal hemorrhages. The roentgen examination showed one shot close to the posterior wall of the sclera, but did not indicate whether in front of or behind it. With a twenty c.c. syringe one drop of a forty percent solution of iodipin and with much air as possible was injected into Tenon's capsule, producing slight exophthalmus and considerable emphysema of the conjunctiva. The immediately applied roentgen rays revealed a very clear picture in which the eyeball was distinctly differentiated from the surrounding layer of air and the shot lying close behind it. The shot was left there, and the eye completely recovered with vision of 5/5. With regard to the technique it is important not to puncture conjunctiva and Tenon's capsule simultaneously, but to carry the needle a little distance under the conjunctiva before piercing the capsule so that the conjunctiva will act as a valve and prevent the escape of air.

C. Zimmermann.

Haase, Alfred. **Injury of the brain through perforating wound of the orbit, with death.** Zeit. f. Augenh., 1929, v. 69, Oct., p. 230.

A four-year-old child fell on a broken ruler and punctured the upper orbital wall posterior to the frontal sinus, the result being a severe general infection of the brain and of its covering membranes. The cause of death was pneumococcic encephalomeningitis.

F. H. Haessler.

Hamilton, J. B. **Note on traumatic asphyxia with ocular complications.** Brit. Jour. Ophth., 1930, v. 14, Jan., p. 22.

A boy aged fifteen years was caught between the door and the floor of a lift. His chest was severely compressed for a period not over sixty seconds. Two and three-fourths hours later his face was swollen and his eyes were bloodshot. Next day the neck was swollen, the patient drowsy, and memory gone. Eyesight did not seem to be affected, at the end of nine days the swelling had disappeared and memory had returned. The reporter observed him on the thirteenth day, when there was extensive bilateral subconjunctival hemorrhage, but no evidence of vascular change in the fundi. Reference is made to Moore's statement: "In instances of traumatic asphyxia from severe compression of the chest of long duration, ocular complications may arise".

D. F. Harbridge.

Heath, W. E. **B. Welchii infection of globe following perforating injury.** Brit. Jour. Ophth., 1929, v. 13, Nov., p. 574.

A man aged forty-six years was observed at 1:30 p.m., twenty-four hours after receiving injury by a chip of concrete causing a small scleral perforation. The cornea was clear. Several small gas bubbles were present in the anterior chamber. Vision shadows. At 5:30 p.m. there were pain, chemosis, and an edematous cornea. Deep anterior chamber, no light perception. The patient felt ill and had a toxic appearance. At 8:00 p.m. there was edema of the upper lid, and a large gas bubble distended the anterior chamber. At 8:30 p.m. evisceration was done; upon cutting into the anterior chamber a definite crackling sensation was felt. Anti-gas serum (B. Welchii) injection gave a reaction. A stab culture from the vitreous gave a gas forming organism identical with B. Welchii.

D. F. Harbridge.

Huber, Otto. **Changes of refraction by traumatism.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 523-525.

Cases of increased refraction after traumatism, or traumatic myopia, have been reported. Huber describes two cases of decreased refraction after contusion of the eyeball in a young woman of twenty years and in a youth of seventeen years, most likely due to shortening of the optical axis.

C. Zimmermann.

Jess, A. **The disappearance of copper deposits in the eye.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 58.

Jess observed complete disappearance of the sunflower copper cataract in five instances and decrease in the deposit once. Four times corneal chalcosis disappeared and twice it diminished. Three times a striking iris discoloration, and in as many instances chalcosis retinæ, disappeared entirely. In some of these patients vision was restored to normal. It follows that brass splinters that do not immediately lead to abscess formation should be removed from the eye only when they are relatively large and easily reached, or when recurrent inflammation or increased tension endangers the eye.

F. H. Haessler.

Mita, H. **Ocular lesions in sulphur miners.** Klin. M. f. Augenh., 1929, v. 83, Dec., p. 797-806. (2 ill.)

Mita observed very painful inflammation of the eyes of about three hundred men after working not very long in a sulphur mine, due to the action of sulphuretted hydrogen. Careful chemical analysis of the atmosphere in the mine showed about 16 per 1,000 of sulphuretted hydrogen, while the test for sulphur dioxide was negative. After staying from twenty to forty minutes in the mine the eye disturbance commenced with a feeling of foreign body in the eye and lacrimation and from one to three hours later colored rings around the lamps were noticed, forcing the men to leave the mine. Almost invariably after some hours longer, violent pain with lacrimation and photophobia set in. At the acme the cornea within the area of the palpebral fissure presented numerous punctiform opaque depressions; the palpebral conjunctiva was reddened, while the ocular conjunctiva was generally intact; and the sensibility of the cornea was more or less diminished.

Experiments on rabbits showed that direct action of sulphuretted hydrogen on the eye caused swelling of the corneal epithelium, with formation of vacuoles. The violent pain is caused by exposure of the nerve endings in the epithelial defects.

Prophylactic measures are improvement of ventilation and shortening of working hours. Gas masks are not necessary, since the eye affection is a direct lesion by the sulphuretted hydrogen, not an indirect one from circulation and respiration. For symptomatic treatment dionin (not cocaine), moist heat, and ointments are recommended.

C. Zimmermann.

Mrazova, Irena. **Ocular injuries with indelible pencil.** Bratislavske Lek. Listy., 1929, Dec., p. 1,271.

The author reports three cases and states that the gravity of the injury is due to the fact that the anilin dyes contained in the ink dissolve in the tissues and, in addition to the mechanical injury, produce a chemical reaction. In one case the patient had introduced a piece of this pencil into his lower conjunctival sac; the result was a prompt conjunctival and corneal necrosis; after three months treatment the patient was discharged with symblepharon of the lower lid and the globe, and 6/9 vision. The second case, in an eleven-year-old girl, ran a similar course and was discharged with scars of the conjunctiva, nebulous cornea, and 6/8 vision. The third was in a thirteen-year-old-boy, who was struck with the pencil through the upper lid, the point of the pencil breaking off; three days later, when he was brought to the clinic, he appeared to have a fluctuating tumor of the orbit, with ptosis, and a dislocation of the eye down and temporally. On incision and curettage there was discharged a violet-blue, sterile secretion; the wound was packed for three days, and the packing was colored blue; with a probe an erosion on the bony orbit could be detected. The boy was discharged in five days with a moderate ptosis. This tendency of the tissues to necrosis is explained by Vogt, who in animal experimentation found that the basic dye combined with the albumen of the cells forming an alkaline

albuminoid. Treatment consists in the removal of pieces of pencil and neutralization of the alkaline dye. Irrigation with a ten percent solution of tannic acid, which forms an insoluble compound with the anilin dye, is recommended by Vogt. Mengelberg and Feilchenfeld advise irrigation with a mixture of dilute acetic acid and ninety-six percent alcohol. In her own cases the writer used oxycyanide of mercury, a noviform bandage, and atropin.

Ray K. Daily.

Pecho, Stefan. **Intraocular foreign bodies and their sequelæ.** Bratislavske Lek. Listy., 1929, Dec., p. 1,269.

This is a discussion of intraocular foreign bodies in general and of fifty-nine cases treated within the last decade in particular; of these thirty were magnetic and twenty-nine nonmagnetic. In twenty-four cases x-ray examination was positive; in one case of a piece of iron 2 by 3 by 1 mm., removed with the magnet, x-ray examination was negative. In forty-six cases the foreign bodies penetrated through the cornea, in ten through the sclera, and in three through a wound of both. In three cases there were in the posterior portion of the globe two particles of stone; in one there were three particles of stone in the anterior chamber. In one case a piece of iron was extracted with the magnet from an iris in which it had been imbedded thirty-eight years; the iris had atrophied and had undergone siderosis. Magnet extraction through the corneal wound was successful in twenty-one out of twenty-three iron foreign bodies. Finally, eighteen eyes were enucleated, twenty patients were discharged with vision above 6/60, and twenty-one with vision below 6/60. *Ray K. Daily.*

Petelen, Daniel. **Scleral ruptures.** Bratislavske Lek. Listy, 1929, Dec., p. 1,264.

Of fifty ruptures of the sclera treated within the last decade, thirty-eight were indirect and twelve direct. Five patients were under the age of twenty years, eighteen between twenty and forty, fourteen between forty and sixty, and eleven older than sixty. One eye had two subconjunctival ruptures, and it was finally enucleated. The complications were: one traumatic cataract; one subluxation of the lens; seven subconjunctival luxations; one dislocation into the vitreous; six iridodialyses; nineteen colobomas of the iris; three prolapses of the ciliary body, four of the iris, and two of the choroid; loss of vitreous in most cases. The results were enucleation of twenty-one eyes; phthisis bulbi of eight; light perception and projection in six; counting of fingers at four meters in thirteen eyes; 6/24 vision in two eyes.

Ray K. Daily.

Pillat, Arnold. **Injuries of the eye caused by the operative treatment of Chinese quacks.** National Med. Jour. of China, 1929, v. 15, Oct., p. 526.

Attention is drawn to injuries of the eyes caused by the "operations" of Chinese quacks. Four typical cases of injury are reported: in a recently needled eye, after needling of the bulbar conjunctiva, and after excision of pieces of the bulbar conjunctiva. The chief sequelæ are ectropion, posterior and anterior symblepharon, tumor-shaped pseudopterygium, limitation of the motility of the eye, anomalies of the position of the eye (strabismus), lagophthalmos, traumatic interstitial keratitis, and often terrible disfigurement. (Eight figures, six in color.)

Ralph W. Danielson.

Pillat, Arnold. **Some injuries of the eye caused by nonoperative and operative treatment of Chinese quacks.** National Med. Jour. of China, 1929, v. 15, Oct., p. 536.

Illustrative cases are fully described to show the results of local applications of certain Chinese drugs and of copper sulphate. Three cases showing severe consequences of needling are mentioned. Some causes are given for prevalence of the quack treatments. (Nine figures.) *Ralph W. Danielson.*

Sabata. **Unusual ocular injuries.** Bratislavske Lek. Listy, 1929, Nov., p. 2,029.

The author gives detailed reports of the following cases: three cases of foreign bodies (a splinter of straw, a splinter of poppy stem, an eyelash) deeply imbedded in the cornea; three cases of foreign bodies (a piece of iron, a piece of glass, an eyelash) penetrating into the anterior chamber; a case of a cornea stung by a bee and a case of corneal injury with an ink pen.

Ray K. Daily.

Sacha, A. **An unusual picture of traumatic keratitis.** Oft. Sbornik, 1929, v. 3, pp. 475-483.

A male aged sixteen years was hit in the left eye with a horse blanket. A wide rupture of Descemet's membrane occurred. The center of the cornea became cloudy and about six times its normal thickness. At first glance it gave the appearance of a keratoconus. In the midst of this cloudy swelling were large blisters, which at times became confluent. A puncture showed the blisters communicating with the anterior chamber. There was only a slight injection of the bulbar vessels, and the cornea lost its sensitiveness. In about six weeks the edema disappeared and the cornea regained its normal function, but healed with a scar and a high astigmatic error. (Bibliography.)

G. D. Theobald.

Scardapane, F. **Clinical and experimental contributions to the knowledge of lesions in the eye due to x-ray.** Saggi di Oftalmologia, 1928, v. 4, p. 428.

Thre cases with the complicating lesions produced by the x-rays are reported.

The first patient, a male aged sixty-one years, was treated for ulcerated epithelioma of the external lid margin near the external canthus of the left eye. The vision was light perception. The ulcerated tumefaction was irradiated with 4 D. E. of soft rays without filter and S. E.=17. The neoplasm became reduced in size, but the intraocular reaction to the rays was very unfavorable. An iridocyclitis followed parenchymatous keratitis and corneal ulceration. The eye was so painful that enucleation was performed. The author reports the presence of great numbers of plasma cells in the bulbar conjunctiva adjoining the limbus, and in the iris and ciliary body, their presence has not hitherto been mentioned by other authors. Leucocytes were few in number, while lymphocytes were more numerous. The observer states that these lesions were directly due to the chemical effects of the x-rays.

In the second case, also one of marginal epithelioma of the lid, the same dosage of x-ray was used. The patient was a male aged sixty-five years. Ten days after the exposure the tumor had diminished in size but there was ocular hyperemia. On the twenty-ninth day the slit-lamp showed nebular opacification of the cornea. Later new vessels were seen to permeate the upper layers of the substantia propria. No ulceration of the cornea occurred. Ten weeks after the treatment was administered the new vessels were still present in the cornea but the opacity had cleared away. Adjoining the limbus were numerous varicosities of the conjunctival vessels. There were iris pigment deposits on the anterior capsule. No trace of the tumor remained.

The individual differences in the results obtained in these two cases prompt the author to assume that there was sensitivity to radiation in the less fortunate patient.

In a third case irradiation for recurrent sarcoma of the orbit after enucleation caused cataractous changes in the lens of the fellow eye. These changes were principally subcortical, anteriorly and posteriorly. In this patient, aged eighteen years, the x-rays were held responsible for the lens changes because of the early age and the latency, the lens opacities coming into notice eight years after treatment. Discission became necessary, and with refractive correction the vision obtained was 0.5.

An attempt at the solution of the problem of radiosensibility and x-ray dosage was made in experimental studies on eight rabbits exposed to hard rays. (The technique used is described.)

The author concludes that the cornea of the rabbit will stand 250 percent D.E. in one administration of very hard rays without being damaged, but that only a large clinical experience can tell surely whether the resistance found by him in the eye of the rabbit compares with that in man. *F. M. Crage.*

Solarikova. **Statistical survey of ocular injuries observed during the last decade at the Bratislava ophthalmic clinic.** Bratislavske Lek. Listy, 1929, Dec., p. 1,252.

This report classifies 3,244 ocular injuries, comprising 7.7 percent of all patients, relative to their etiology, type of injury, complications, and visual results; 71.66 percent were occupational injuries, 18.7 percent perforating injuries, and 3.9 percent burns. In comparison with the author's statistics the German and English statistics show a higher percentage of burns, and a lower percentage of perforating injuries.

Ray K. Daily.

17. SYSTEMIC DISEASES, AND PARASITES

Böck, J. **Case of periarteritis nodosa with histologically demonstrated changes in the vessels of the ocular muscles and of the ciliary body.** Zeit. f. Augenh., 1929, v. 69, Oct., p. 225.

The clinical and autopsy findings in a patient suffering from generalized periarteritis nodosa are described. The points of ophthalmologic interest are diplopia caused by interference with the action of the extraocular muscles, anisocoria, absent light reflex in the left pupil, and ptosis of the left upper lid. The anatomical basis for these clinical findings is involvement of the arteries of the extraocular muscles and ciliary body in the general periarteritis nodosa.

F. H. Haessler.

Esteban, Mario. **Ophthalmomyiasis.** Arch. de Oft. Hisp.-Amer., 1929, v. 29, Feb., p. 57.

In Spanish Morocco, perhaps due to the climate and kind of life of the natives, the larvæ of the common fly frequently develop in the eye. The author has seen several cases in which patients came in great distress complaining of terrible pain and the sensation of numerous foreign bodies which moved and scratched the conjunctiva inside of the lids, producing blepharospasm and photophobia. When the eye is opened it is easy to observe numerous white bodies which move rapidly and cause great irritation. The author has devised a new treatment. Instead of mechanical removal of the larvæ one by one, which is a tedious and ineffective method, he uses calomel salve ten percent. With a single application all the parasites are destroyed.

M. Uribe Troncoso.

Herrenschwand, F. **Morphological ocular changes in periarteritis nodosa in comparison with those in sepsis lenta.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 419-432. (6 ill.)

The autopsy of a man aged thirty-five years who had been affected with rheumatic pains, swelling of the joints, andalbuminuria, staphylococci being found in the blood, revealed typical periarteritis nodosa in the aorta, coronary arteries, and abdominal organs, with infactions in the spleen and kidneys. In the right eyeball the long ciliary arteries showed nodules produced by accumulation of leucocytes in the adventitia. The media, through which granulation tissue from the adventitia penetrated to enter and pass through the intima, was intensely thickened and altered. In other sections the media was converted into tough cicatricial tissue, almost obliterating the lumen. There was also a periarteritic nodule on the central retinal artery behind the lamina cribrosa. The nodules occurred at the places where the arteries were subjected to constriction, as for example at the lamina

cribrosa, and at the entrance into the sclera under the muscles.

Both pariarteritis nodosa and sepsis lenta are of toxic infectious origin and show great variety in their localization in different organs, but periarteritis nodosa leads to fatal termination within a few weeks or months, while sepsis lenta may continue for years.

C. Zimmermann.

Herrenschwand, F. **Ophthalmoscopic changes in tuberous cerebral sclerosis.** Klin. M. f. Augenh., 1929, v. 83, Dec., pp. 732-736. (2 ill.)

Tuberous cerebral sclerosis, first inscribed by Bourneville in 1883 as a clinical picture, belongs to the group of idiocies, accompanied by marked mental inferiority. It may, however, set in in later life with epileptiform attacks, decrease of intelligence and deterioration of character. Lues, chronic alcoholism, and insanity in the parents, and also multiple hemorrhage at birth, are mentioned as probable causes. Only a few cases have been reported. The present one occurred in a young woman aged twenty-seven years, whose father had died from dementia paralytica. She was under neurological treatment on account of epileptiform seizures, which had set in in 1922. The skin of the face was covered with numerous nodular sebaceous adenomas, such as are encountered in tuberous sclerosis. At the nasal margin of the left optic disc was a white nodular tumor the size of half a disc diameter, projecting three diopters into the vitreous, and covered with small bloodvessels. The eye showed also a temporal conus and myopia of minus 4.00 D.

Van der Hoeve examined three cases histologically and proposed the term neurocytophacoma for these tumors, probably blastomas, which may become differentiated at varying ages and may at times display malignancy or may have a tendency to inflammation.

C. Zimmermann.

Magnasco, M. **The value of cholesterin in some ocular affections.** Saggi di Oftalmologia, 1928, v. 4, p. 97.

Gerontoxon was found to be a corneal infiltration with lipoids, especially cholesterin, from the blood. This fact brought further studies in the possible relationship of cholesterin to other ocular conditions. A higher ratio of blood cholesterin was found in individuals in whom arcus senilis was accompanied by brown, markedly sclerotic cataract or xanthelasma. The cases of ordinary senile cataract with well marked gerontoxon showed no relative increase in cholesterin. Two cases of cataracts nigra showed a marked increase of this substance in the blood.

To explain the relationship between hypercholesterinemia and these conditions, the author assumes the occurrence of lowered cellular metabolic exchange with augmentation of blood cholesterin and a tendency toward accentuated lenticular sclerosis.

In nephritic retinitis cases there was great variance in the blood content of this substance, out of proportion with the degree of retinitis found. The author does not admit that hypercholesterinemia is the principal cause of chronic nephritic retinitis.

F. M. Crage.

Pillat, Arnold. **The frequency of deficiency diseases of the eye due to lack of vitamin A in a military camp north of Peiping.** National Med. Jour. of China, 1929, v. 15, Oct., p. 585.

In a military camp of 3,000 soldiers, 209 men with eye diseases were examined. Of these 209 soldiers, 91 suffered from one or other of the various vitamin A deficiency diseases of the eye. Nightblindness, pigmentation of the semilunar fold and of the fornix conjunctivæ, Bitot's spots and wrinkling of the bulbar conjunctiva, prexerosis of the cornea, and real keratomalacia were found. The high number of keratomalacia cases, thirteen percent of the total number with deficiency diseases, is remarkable. Anemia was frequently observed. In addition to the deficiency, supporting factors were the severe climate and the physical labor. Of the 209 patients with eye diseases exam-

ined, 207 (99 percent) had trachoma. (References.) *Ralph W. Danielson.*

Piness, G. and Miller, H. **Specific protein reactions in the eye, ear, nose, and throat.** Ann. Otol., Rhin., and Laryng., 1929, v. 38, Sept., p. 691.

This is a review of the theories and literature regarding the different forms of allergy and the results of treatment. The authors state that if the otorhinolaryngologist is conversant with the picture of allergy there will not be so much unwarranted surgery in this field. *Ralph W. Danielson.*

Rothenberg, Simon. **Fundus changes in epidemic encephalitis.** Jour. Nerv. and Mental Dis., 1929 v. 70, Sept., p. 271.

The author gives nine case reports, the usual picture being that of an illness of a few weeks to several months, the complaints being headache, vomiting, and decreased vision, associated with slight fever, increased pulse, mental disturbances, transient paralyses, and changes in the fundi. Attention is called to the fact that in this disease several kinds of syndrome have been found to exist from time to time in different localities. A review of the literature would lead one to believe that fundus changes are quite infrequent in epidemic encephalitis, and yet here is a series of cases in which the predominant features are neuritis, choked disc, optic atrophy, or sudden amaurosis. (Bibliography.) *Ralph W. Danielson.*

Sweeney, J. S. **Endocrinology in eye, ear, nose, and throat practice.** Texas State Jour. Med., 1929, v. 25, Oct., p. 421.

Sometimes a diagnosis of endocrine disturbance is made from eye, ear, nose, and throat abnormalities alone, and conversely findings here can often be explained only on an endocrine basis. The frequency of headaches, tinnitus, visual disturbances, deafness, vertigo, changes in fundi, rhinorrhea, photophobia, epistaxis, excessive lacrimation, keratitis, and exophthalmos in the various types of disease is given. Most of the data are obtained from the series of articles by Lawrence and Rowe in "Endocrinology" during 1928. (Discussion and bibliography.) *Ralph W. Danielson.*

Terrien, F. **Ocular complications after use of the arsenicals.** Arch. d'Opht., 1929, Sept., v. 46, p. 513.

Numerous arsenicals such as atoxyl have been discarded on account of their toxicity. Those in use, particularly the arsphenamines, are not without danger of toxic reactions. These reactions may be divided into a purely toxic group, an early specific or Herxheimer reaction and a late toxic effect on nerve tissue. In the first group conjunctival and pericorneal hyperemia is often noted and should serve as a warning of sensitivity. No reaction has been observed in the normal cornea. Mild attacks of iritis have been produced and transient myopia probably due to ciliary spasm has been reported. Retinal hemorrhages and chorioretinitis may be produced. In the second group one may find a flare-up of a keratitis or iritis due to sudden liberation of toxins through rapid destruction of spirochetes. The arsenicals seem to have no effect in preventing involvement of the second eye in interstitial keratitis. Cases of optic neuritis and atrophy following treatment of syphilis with the arsenicals are very numerous. In the third group the sudden destruction of spirochetes may prevent the development of antibodies against them and permit a later attack of nerve tissue under mercurial treatment. If sterilization is slower, more antibodies are developed. So a warning is issued against the use of the arsenicals except in cases which do not respond to bismuth and mercury, and especially not to use them in cases where the optic tract is affected, as in tabes. *M. F. Weymann.*

Vinazzer, E. **Rubescent vision.** Med. Klin., 1929, v. 25, Sept. 6, p. 1395.

The author reports three cases of rubescent vision found in uremic patients. The visual changes occurred as

an early symptom of the uremia and the author states that they were due to changes in the fundi. He considers the rubescence when it occurs as pathognomonic of uremia.

Beulah Cushman.

Vogt, Alfred. **Copper and silver stored in eye, liver, spleen, and kidneys as symptom of pseudosclerosis.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 417-419.

From examination with the slit-lamp of the pigment ring in a case of pseudosclerosis, Vogt affirms the identity of the pigment with silver stains in the cornea, and also relates copper cataract to accumulations of copper in the liver. The patient whose clinical history is here reported died after having been shown many times as an example of pseudosclerosis. The liver contained 29 mg. of copper and 1.2 mg. of silver in 100 mg., the kidney 1.7 mg. of copper and 10 mg. of silver, the spleen 1.4 mg. of copper and 2.5 mg. of silver in 100 mg. This shows that in cases of pseudosclerosis with a pigment ring on Descemet's the liver and kidneys have the peculiar property of storing metals which enter the alimentary canal in traces. The chemical analysis proved that the cataract diagnosed by Vogt as copper cataract and the opacity of the lens epithelium illustrated by him are actually caused by copper.

Since then Vogt has found silver in Descemet's membrane after internal medication with silver in one case and with argyrosis of the conjunctiva in two cases. *C. Zimmermann.*

18. HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Barrett, James. **Visual standards for navigating officers.** Med. Jour. Australia, 1929, Nov. 16, p. 724.

In the ophthalmological section of the Victorian branch of the British Medical Association, Barrett proposed that a deputation from this section should wait upon the premier urging the necessity for some form of supervision of the visual acuity of members of the mercantile marine; and suggesting that a periodical ocular examination should be made of all navigating officers in that service, and that when a marine accident occurred it should be a rule always to have the eyes of the officers concerned examined and reported upon by a competent oculist.

The speaker remarked that when an accident occurred at sea an explanation was sought for diligently, but there was no visual test of the responsible persons concerned. He instanced an officer in the mercantile marine, with grossly defective color vision, who for years had been in a responsible position. The standards of entrance for the Port Phillip pilot service (Melbourne) had resulted, he said, in a very high level of visual efficiency.

Edward Jackson.

Beck, J. C. **Minimum requirements for the department of ophthalmology, rhinology, and otolaryngology in a general hospital.** Bull. Amer. Coll. Surg., 1929, v. 13, June, p. 5.

This is a report by the eye, ear, nose, and throat section of the American College of Surgeons as a part of the hospital standardization work of the College. The requirements and their detailed explanation cannot be abstracted satisfactorily.

Ralph W. Danielson.

Davidson, Morris. **Medicolegal problems in ophthalmology.** Rev. Cubana de Oft., y Oto-Rino-Laring., 1930, v. 2, Jan., p. 3.

Visual efficiency should not be confused with visual acuity according to the Snellen scale, but must be converted into the percentage of efficiency according to the arbitrary tables adopted in each country. In determining this two additional factors enter into the calculation: (1) the lessened industrial usefulness of a one-eyed workman; (2) the fact that the future loss of one eye would render him totally blind.

For partial loss of function of one eye, the indemnity varies in each country. Vision of 20/40 is regarded as a

loss of 16.5 percent in the United States, 22.5 percent in Germany, and 10 percent in France. Vision of 20/60 is 30 percent loss in the United States, 40 percent in Germany, and 33 percent in France. 20/100 equals a loss of 51 percent in the United States, 52.5 percent in Germany, and 60 percent in France. The United States federal law also takes cognizance of loss of accommodation, defects of the visual field, loss of binocular vision, and the presence of diplopia. After an accident that necessitates the use of glasses the loss is adjudged as between that shown with and without glasses. Hemianopsia or concentric contraction in one eye to within 10 percent is regarded as equivalent to loss of the eye.

Other problems discussed include the relation of trauma to prexisting disease; amblyopia ex anopsia; and simulation. To detect simulated monocular blindness, a ten degree prism base up or down before the supposedly affected eye, with instructions to the patient to run up and down steps, will uncover the fraud. *A. G. Wilde.*

Maggiore, L. **On the indemnity due to a monocular workman on loss of second eye.** Ann. di Ottal., 1929, v. 57, June-July, p. 557.

This important medicolegal question on being submitted by the Sassari court to Maggiore for an opinion is answered in elaborate detail. Loss of a single eye, according to the Italian law, does not entitle the claimant to an indemnity of fifty percent of total loss. He, it is true, is not the equal of a normal man. His visual field has been limited, he no longer has stereoscopic vision and has not depth perception. But in many lines of activity he can still work as effectively as a man with both eyes. In the case cited, the wages had not been reduced because of the primary loss, and the contract which had secured him insurance against loss from injury had been made with the understanding that he had but one eye. In the Italian courts, with the assumption of one hundred percent as normal for one with both eyes effective, the loss of one eye carries an indemnity of thirty-five percent. But when the second eye is lost would this be adequate compensation? Obviously not, for the man is now wholly disabled. Considering deprivation of the first eye as a loss of thirty-five percent the remaining eye had a value of sixty-five percent at the time of injury. This amount was allowed, and Maggiore's argument, repeated by the judge, was incorporated into the law. *Park Lewis.*

Marquez M. **The retinal image and the visual function in relation to the astigmatism of the painter El Greco.** Arch. de Oft. Hisp.-Amer., 1929, v. 29, May, p. 249.

This is a long polemic article dealing with relations of the retinal image with external objects and brain perception. Dr. Marquez believes that the famous painter El Greco was not decidedly astigmatic and that the great elongation of many of his subjects' faces and bodies in one direction does not prove astigmatism, because the deformation is sometimes vertical and at other times horizontal or oblique. That was the painter's technique. (See also American Journal of Ophthalmology, 1929, October, page 847.)

M. Uribe Troncoso.

Morax, V. **Trachoma and industrial accidents.** Rev. Internat. du trachôme, 1929, v. 5, April, pp. 95-100.

Morax reports a case of trachoma induced by a burn of the lids and conjunctiva of the right eye, with transmission of the infection to the other eye. Corneal involvement caused marked reduction of vision, so that the patient was awarded a seventy percent disability for one year. *George H. Stine.*

Muldoon, W. E. **Diseases of the eye encountered in Honduras.** Seventeenth annual report of the medical department of the United Fruit Company. 1928, p. 239.

Muldoon reports high incidence of

pterygium, scleritis, apparently luetic, macular choroiditis, and acute catarrhal conjunctivitis with corneal ulcer as a complication. One case of nonmalarial dendritic ulcer was observed. Eight cases of glaucoma hitherto unsuspected were found. A statistical summary is appended. *Ralph W. Danielson.*

Nicolich, M. **Eye hazards in industrial occupations.** Arch. de Oft. Hisp.-Amer., 1929, v. 29, p. 270.

This is a condensation of the report of the (American) National Society for the Prevention of Blindness, as to industrial accidents involving the eye.
M. Uribe Troncoso.

Nicolich, M. **Prevention of trachoma or prevention of blindness?** Arch. de Oft. Hisp.-Amer., 1929, v. 29, Apr., p. 213.

Trachoma is only contagious when its agent finds a way to the external world, and for this reason it is much more important to prevent and cure the attacks of acute conjunctivitis and all secreting diseases of the conjunctiva in trachomatous patients than the chronic conditions which are not contagious. When there is a conjunctival discharge the patient must be isolated and treated in special institutions, in outdoor clinics, or by ambulant eye dispensaries. Trachoma is not a geographical disease. Its spread is in inverse relation with the education and hygienic conditions of the people of a given country. The more important source of contagion is from person to person, but there are undoubtedly other external sources of infection not yet determined.
M. Uribe Troncoso.

Pi, H. T. **Historical sketch of native ophthalmology in China.** National Med. Jour. of China, 1929, v. 15, Oct., p. 604.

This is a paper of especial interest in the history of ophthalmology. It deals with the drugs and surgical measures advised by native books on the subject. Naturally many false and weird beliefs are extant, for example that the caruncle is directly connected with the most important part of the heart. Needling for cataract is made the occasion for incantations, charms, rituals, and other ceremonies. (Four figures and one reference.)
Ralph W. Danielson.

Royer, B. F. **Constructive program for sight-saving classes in Pennsylvania.** Pamphlet of National Soc. for Prevention of Blindness.

Royer gives a history of the incipiency of the movement, and a résumé of eye conditions which make a child a candidate. It is estimated that one child in a thousand should be in such a class. Ohio is first and Pennsylvania is thirteenth among the states as regards ratio of classes to population. So far all such classes have been in the cities, neglecting the rural population. Reiter has advised that rural communities organize to send their children to the cities to be cared for in such a class. Royer suggests that in order to carry this out it would be a good idea to group a class in one house under the case of a house mother. He suggests further that these houses be located in the same cities as the teachers' colleges, to be run in conjunction with them. By this plan, not only would the children be cared for, but the idea of such classes would be taught to the future teachers.
Ralph W. Danielson.

Small, C. P. **The routine examination of the eye in its bearing on the present-day motor traffic.** The Penn. Med. Jour., 1929, v. 33, Nov., p. 55.

Small emphasizes that in this day of rapid speed and traffic congestion the utmost in vision is necessary for the greatest safety. To this end he urges complete, careful, and unhurried examinations which are to include testing of stereoscopic vision, the strength of convergence and divergence, and the color sense. It is pointed out that the testing of school children for defects of vision is not complete or accurate unless done under a cycloplegic. The author favors this as a routine in high school.
Ralph W. Danielson.

NEWS ITEMS

News items in this issue were received from Drs. C. A. Clapp, Baltimore, Gaylord C. Hall, Louisville, and G. Oram Ring, Philadelphia. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. Edwin James Gardiner, Chicago, aged seventy-three years, died January ninth, of heart disease.

Dr. Guy Lincoln Noyes, Columbia, Missouri, aged fifty-seven years, died February fourth, of heart disease.

Dr. Frederick William Browning, Hayward, California, aged sixty-four years, died December thirtieth, 1929, of carcinoma of the stomach with metastasis to the liver.

Miscellaneous

For the first meeting of the Association for Research in Ophthalmology, in Detroit, on June 24, 1930, a tentative program has been arranged as follows: "Review of the literature on the etiology of acute iritis", by Sanford Gifford, Chicago; "Syphilis in the etiology of acute iritis", by J. Earle Moore, Baltimore; "Tuberculosis in the etiology of acute iritis", by William C. Finnoff, Denver; "Endogenous infections in the etiology of acute iritis", by Lewellys Barker, Baltimore; "Immunology and bacteriology in the etiology of acute iritis", by John A. Kolmer, Philadelphia; "Evaluation of etiologic factors in acute iritis", by Thomas B. Holloway, Philadelphia.

About thirty physicians took the course in physiologic optics given by Dr. Edward Jackson in Saint Louis in the early part of March.

Dr. Arnold Pillat of Vienna gave an intensive course in ophthalmology at Kansas City during the middle two weeks of March. His subjects included external diseases, fundus diseases, eye operations, anatomy of the eye and histopathology, clinics, methods of examination, examination with the slit-lamp and Gullstrand's ophthalmoscope, bacteriology of the eye, and refraction. The course was given under the auspices of the school of medicine and university extension division of the University of Kansas.

British ophthalmologists are having difficulty in obtaining a satisfactory arrangement for examinations for glasses under the national health insurance acts. Two principal schemes are being advocated. Under the first, which is being strongly objected to by the Council of British Ophthalmologists, clinics for these insured patients would be arranged either at the doctor's office or at a district center which would be organized by a group of opticians; and in each case collection of the small fee allowed the ophthalmic physician would be undertaken by the optician. The second plan, proposed by the ophthalmic hospitals of London, would provide clinics for this purpose at the hospitals, and the ophthalmic physician by whom the patient was consulted at the clinic would receive the recognized fee for consultation. The latter scheme would be more satisfactory to the ophthalmologist, would be less expensive, and would be under proper supervision.

Abnormal conditions of the eyes were found among twenty-one percent of the kindergarten and nursery children examined in a four-year study of the vision of preschool age children in New York City recently completed by the National Society for the Prevention of Blindness. Records were obtained from twenty-one kindergartens and nurseries in Brooklyn and Manhattan, with thirty nationalities represented. Twelve ophthalmologists of Manhattan and Brooklyn gave freely of their services to the Society in the study.

By a gift from the Commonwealth Fund, New York, to Washington University, Saint Louis, provision has been made for a five-year research into the cause and cure of trachoma. The gift will consist of $50,000 annually for a period of five years. Dr. Harvey J. Howard, professor of ophthalmology, Washington University School of Medicine, Saint Louis, will be the director. The work will be conducted in the Oscar Johnson Institute which, with the McMillan Hospital, is now being erected by Washington University.

The health organization of the League of Nations recommends the adoption of a general standard of blindness. For the purpose of the United States census, instructions to the 1920 enumerators were: "Include as blind any person who can not see well enough to read even with the aid of glasses. The test in infants must be whether they can distinguish forms and objects, and in the case of illiterate older persons whether they can see well enough to read if they knew how to read. Do not include a person who is blind in one eye only."

In a recent report to the United States Public Health Service a reduction in the amount of trachoma for 1928 among the Indians of Arizona and New Mexico is noted. Less than nine percent of the 6,700 Indians examined were affected, as compared with twenty-four percent of the 4,700 Indians examined in 1912. In 1924 an increase in congressional appropriations permitted the first organized effort against trachoma. Seven ophthalmologists and thirteen nurses were assigned to specified districts in the Indian country.

Societies

The Louisville Eye and Ear Society had its annual meeting in February at the Pendennis Club. The guest of honor was Dr. Arthur Bedell of Albany, New York, who entertained the large crowd with a splendid series of photographs of the fundus and a talk on this subject.

At the meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia, March twentieth, the following cases were shown: by Dr. C. E. G. Shannon and Dr. Perce de Long, retinitis striata; by Dr. Luther C. Peter, tendon transplantation for paralysis of the superior rectus; by Dr. George Cross, a foreign body in the lens. Papers were read by Dr. W. E. Fry (by invitation) on variations in the intraneural course of the central vein of the retina; and by Dr. Burton Chance on Nicholas Culpepper, an English ophthalmologist.

From December 27 to 31, 1929, a pan-Ukrainian ophthalmological congress was held in Charkow, Russia.

During the jubilee meeting of the Ophthalmological Society of the United Kingdom (fiftieth anniversary meeting), held from April 2 to 5, 1930, the members of the Ophthalmological Society were the guests of the Royal College of Surgeons at a reception on April third. The Bowman lecture was given by Sir Arthur Keith, on "The genius of Sir William Bowman." The jubilee meeting was attended by a number of distinguished foreign guests.

Personals

Dr. and Mrs. E. C. Ellett of Memphis have been on a pleasure trip to Cuba.

Dr. William H. Wilmer spent his midwinter vacation at Palm Beach, Florida.

Dr. Charles A. Bahn of New Orleans has been enjoying a sojourn in Mexico.

Dr. James M. Shields of Denver has been appointed assistant professor of ophthalmology in the medical department of the University of Colorado.

Dr. Benjamin Alexander, formerly of Montreal General Hospital, has been appointed chief medical officer of the Royal Eye Hospital, Manchester, England.

Professor Selig Hecht of Columbia University recently lectured at Harvard University medical school on the nature of the visual process, under the auspices of the Howe laboratory of ophthalmology.

A recent issue of the Russian Ophthalmological Journal appeared as a special number of 250 pages in honor of Professor Golowin's forty years of ophthalmologic activity. Professor Golowin is the senior of the active Russian professors.

The issue of Annales d'Oculistique for December, 1929, contains an article by Dr. Conrad Berens of New York, entitled "Études sur l'immunité dans ses rapports avec l'ophtalmologie. Vaccins et thérapeutique non spécifique" (Studies on immunity in its relation to ophthalmology. Nonspecific vaccines and therapy).

A department of "questions and answers"

Dr. Lawrence Post, who is in charge of the new department of questions and answers which will probably make its bow in our May issue, will be glad to hear from readers of the American Journal of Ophthalmology who have questions which they would like dealt with in this department. Address **Dr. Lawrence T. Post,** 524 Metropolitan building, Saint Louis.